Australian Government
National Emergency Management Agency

Australian Institute for Disaster Resilience

iag

Maintaining momentum: driving systemic change to create a more resilient future

adrc 24

Australian Disaster Resilience Conference

CONFERENCE POSTERS

4 – 5 SEPTEMBER 2024 ICC **SYDNEY**

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Contents

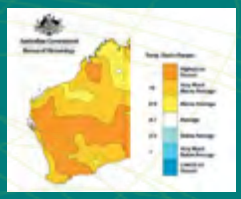
Tackling heat vulnerability with local solutions:

Piloting Heat Interventions in Western Australia.

Heat Vulnerability Mapping

The heat vulnerability map will map regions where people are at risk from high heat and their underlying vulnerability.
The final result will be two-fold, a publicly available interactive geospatial map, ideally with additional heat preparedness resources on a webpage The Project will use existing research and analysis to create an interactive geo-spatial map that identifies regions with high heat risk and heat-vulnerable populations in Western Australia. The Project will map a range of vulnerabilities to high heat in Western Australia by geographic region, taking population demographics into account.
Variables that impact heat vulnerability include: heat exposure, ability to adapt to high heat, and existing conditions (socioeconomic and health) that make people sensitive to heat.

Reducing illness and lives lost from Heatwaves. https://www.pean.gov.au/sites/default/files/2021-10/BOM (2021) Heatwaves report.pdf



Bureau of Meteorology (BOM), Department of Health (DOH), Bureau of Statistics (ABS), & Geoscience Australia (GA). (2021, March).

Project Overview

The purpose of this project is to map regions impacted by high heat, against vulnerable populations affected by high-heat across WA and pilot interventions. Including developing targeted strategies, actions and resources to enable communities, including government agencies, and those most vulnerable to better prepare for high heat-related consequences to their health and well-being. Our process with the project is multifaceted and stems from community to local government, to state government up until federal government. Our community engagement processes allow us to have an ethical and community focused lens to heat interventions, whilst our government ties allow us to expand our mapping network and logistic capabilities.

Summary of Project Outcomes

Better understanding of heat risk and vulnerability across Western Australia

Identification and mapping of community assets and vulnerable cohorts

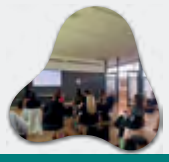
Community resilience and education strategies for at risk groups

Guidelines, resources and evaluation measures for high heat responses

Recommendations to contribute to a state policy response

Rockingham (Whadjuk Country)

One of our pilot sites is Rockingham, 48km from Perth. The City is an urban hub with a highly transient population. Community organisations including emergency relief groups have been engaged . We also meet regularly with representatives from the Rockingham local government, which allows us to have consistent engagement through the design and implementation of these heat interventions. The City is exploring interventions like: a *subsidy scheme for cooling items, transporation to cool spaces, places to cool off, and training on ways to keep cool.*



Port Hedland (Kariyarra Country)

Port Hedland, known as Marapikurrinya in Kariyarra, is the second largest town in the Pilbara. The Pilbara area experiences warm weather year-round, with particularly extreme conditions during most of the summer and temperatures often exceeding 30 degrees even in winter. Our team has engaged with Aboriginal corporations, services, and community organisations, and prioritises First Nations involvement. The local government is also engaged and exploring interventions like *water fountains, community education for children, cooling paths for walking , etc.*

Bridgetown/Greenbushes (Bibbulmen and Wardandi Country)

The Shire of Bridgetown–Greenbushes, situated approximately 260 kilometres south of Perth. It has a population of approximately 5,300 with the majority of the community based in Bridgetown. This Shire is an aging population with many rural farming families. Community organisations are strongly engaged and are helping pilot several of the interventions. This Shire is considering implementing *heatwave warnings*, *cool spaces*, and *water fountains*.

Heat Interventions

Cooling Packs
Community Education
Water Fountains
Shade Sails
Tree Planting
Cool Spaces
Transport During Heatwaves
Medication Delivery During Heatwave
Subsidy Schemes- Cooling Items
Public Health Campaigns
Public Greening

Heat Vulnerability Project Partners

Government of Western Australia Department of Communities

Government of Western Australia Department of Health

Governance Groups

Curtin University

Telethon Kids Institute

LinkWest

WALGA

Climate Justice Union

Australian Government Bureau of Meteorology

Disaster Risk Reduction & Resilience
Funded by the National Disaster Risk Reduction Program

wacoss wa council of social service

Enhancing Disaster Resilience

Risk Awareness and Preparedness for Multilingual Communities in NSW

Culturally and Linguistically Diverse Communities in NSW

- Over 29 percent of the NSW population are born overseas, with 23 percent born in non-English speaking countries.*
- Often live in locations with higher exposure to hazards.
- Rely on non-mainstream communication channels: WeChat, LINE app, community radio, ethnic news sources.

NSW State Emergency Service Communications

Majority of communications were:

- Written or spoken in English.
- Delivered through mainstream communication channels: Facebook, Instagram and Linkedin.
- Had limited reach and impact with CALD communities.

Flood, Storm, and Tsunami: Awareness and Preparedness for NSW Culturally and Linguistically Diverse Communities Project

Key focus areas:

1. **RESEARCH**
   Collaborated with the **University of Wollongong** to determine the most at-risk language groups based on the intersections of population size, exposure to risk of flood, storm and tsunami, and level of English language proficiency.

2. **MULTILINGUAL COMMUNICATION ASSETS**
   Engaged **Ethnolink Language Services** to design and develop a comprehensive suite of multilingual assets for flood, storm and tsunami risk awareness and preparedness campaigns.

3. **COMMUNITY CONSULTATION**
   Formation of **CALD Stakeholder Network** comprising 25 members, representing 15 priority language groups from over 20 countries.

- 3 Hazards
- 1000+ Multilingual Assets
- 15 Language Groups
- 25 CALD Network Members

- ✓ Increased capability to utilise appropriate communication channels for a multicultural audience.
- ✓ Increased understanding of hazard risks for multicultural communities of NSW.
- ✓ Enhanced disaster resilience for multicultural communities of NSW.

Australian Government
NSW GOVERNMENT
SES NSW STATE EMERGENCY SERVICE
Jointly funded under the Australian Government – NSW Government National Partnership Agreement on Disaster Risk Reduction

*ABS Census 2021

SAFETY IN THE GAME

USING SPORTING ORGANISATIONS AS TRUSTED AND EFFECTIVE CHANNELS OF SAFETY MESSAGING

The strategic partnership between Fire and Rescue NSW (FRNSW) and Western Sydney Wanderers Football Club (WSW) is an insight into culturally diverse fire safety messaging and education through sport.

ゲーム内の安全性

امنیت در بازی

比赛中的安全

السلامة في اللعب

RESULTS

- An email newsletter focusing on spring fire safety tips was delivered to over 80,000 WSW members, with a unique open rate of 23%.
- Schofields and Huntingwood fire stations also attended WSW HQ where they engaged with 500 culturally diverse youth at a 5-a-side tournament.
- FRNSW has seen a significant increase in the reach of fire safety messaging as well as local fire stations in Western Sydney completing more Safety Visits.

NEW WAYS TO COMMUNICATE

The landscape of information dissemination has evolved in recent years, with a departure from traditional media such as TV, radio and print. This shift is particularly noteworthy among individuals from Culturally and Linguistically Diverse backgrounds (CaLD), who often gravitate towards sources they deem trustworthy.

In NSW, nearly one third of residents were born overseas, with more than 300 different languages spoken in homes across the state.

A MUTUAL PARTNERSHIP

In response to these statistics, and the need to build trust for effective communication, FRNSW partnered with WSW to leverage the club's extensive network to promote home fire safety. At the same time, WSW leverages from FRNSW's trusted and heroic brand.

The success of this initiative highlights the universal nature of sports as a platform for relationships and communication, regardless of culture. The partnership between FRNSW and WSW provides a sense of connection, especially when utilising resources in various languages and dialects.

For more information on this project scan the QR code

To book a FREE Safety Visit scan the QR code

The importance of place-based community organisations in disasters
REFLECTIONS FROM 'THE WELLBEING PROJECT'

Rajesh Bhusal [1], Angela Van Dyke [2], Margaret Tipper [1], Christina Klassen [1], and Niki Baroy [1]

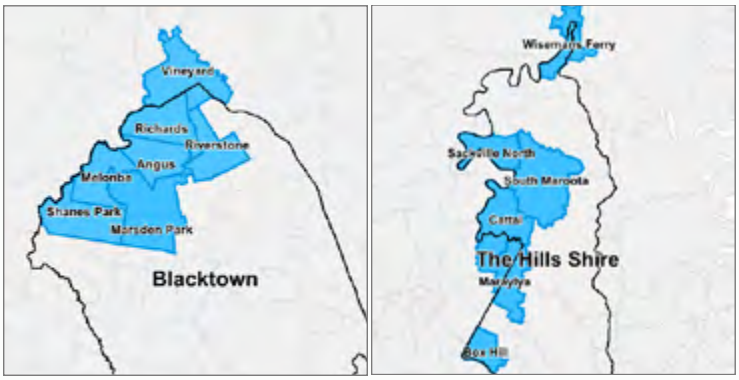
1 Western Sydney Regional Information and Research Service (WESTIR) Limited
2 North West Community Services Inc. (NWCS)

Background

As a response to the four floods in New South Wales (NSW) throughout 2021 and 2022, North West Community Services (NWCS), a place-based organisation located in Riverstone, NSW, initiated The Wellbeing Project - My Liveable Neighbourhood. The project was funded by the Western Sydney Primary Health Network in thirteen suburbs within the Blacktown and The Hills Shire Local Government Areas (LGAs). These LGAs are part of the Sydney North West Growth Area and are also home to a large number of culturally and linguistically diverse communities. NWCS commissioned WESTIR Ltd to evaluate and prepare a report on the project.

The Wellbeing Project

The Wellbeing Project was implemented from August 2023 to February 2024 with the goal of promoting individual and community wellbeing. Disasters have long-term effects in the community after the initial events. The impacted communities benefitted through project initiatives, such as community events and festivals, therapeutic support, health and wellbeing programs, community education opportunities, casework and brokerage, website creation, and a community survey.



Project Learnings

- Resilience is built every day in a community, not during or after a crisis. Current models of resilience building are also not community-led or person-centred.
- Existing trust and relationships with local communities assist greatly during disaster responses and recovery.
- Lack of prior interaction with communities makes it challenging to collaborate effectively before, during, and after disasters.

Recommendations

- Place-based community organisations should be well-represented in disaster management and planning spaces, not just during the crisis, but before and after.
- Funding is needed for long-term disaster recovery and resilience, even though short-term or project-based funding has benefits.
- Local and place-based relationships foster community resilience and can, therefore, provide effective responses to disasters with reduced costs.

Disaster Resilience Factor Groups

The Bushfire and Natural Hazards Cooperative Research Centre (2020) measures local disaster resilience across Australia, examining eight factors as strengths and barriers. All Statistical Areas Level 2 (SA2s) were then categorised into five unique resilience factor groups. The table below shows these factor groups for the thirteen suburbs in Blacktown and The Hills Shire LGAs.

Regions	Group	Social character	Economic capital	Emergency services	Planning and the built environment	Community capital	Information access	Social and community engagement	Governance and leadership
Blacktown									
Angus	1	Low	Moderate	High	Moderate	Low	Moderate	Low	Moderate
Marsden Park	1	Low	Moderate	High	Moderate	Low	Moderate	Low	Moderate
Melonba	1	Low	Moderate	High	Moderate	Low	Moderate	Low	Moderate
Richards	1	Low	Moderate	High	Moderate	Low	Moderate	Low	Moderate
Riverstone	1	Low	Moderate	High	Moderate	Low	Moderate	Low	Moderate
Shanes Park	1	Low	Moderate	High	Moderate	Low	Moderate	Low	Moderate
Vineyard	2	High	Moderate	Moderate	Moderate	High	Low	High	Moderate
The Hills Shire									
Box Hill	4	Moderate	High	Moderate	Moderate	Moderate	High	Moderate	High
Cattai	2	High	Moderate	Moderate	Moderate	High	Low	High	Moderate
Maraylya	2	High	Moderate	Moderate	Moderate	High	Low	High	Moderate
Sackville North	2	High	Moderate	Moderate	Moderate	High	Low	High	Moderate
South Maroota	2	High	Moderate	Moderate	Moderate	High	Low	High	Moderate
Wisemans Ferry	2	High	Moderate	Moderate	Moderate	High	Low	High	Moderate

Community Resilience Framework

Informed by learnings from The Wellbeing Project, a community resilience framework is proposed, which centres local voices, networks, and relationships as a key component in resilience building.

Based on Bronfenbrenner's Ecological Systems Theory

Community Resilience-Building Continuum

Contact Details:
North West Community Services - nwcs.org.au, reception@nwcs.org.au
WESTIR Limited - westir.org.au, mail@westir.org.au
Link to report - https://www.westir.org.au/publication/the-importance-of-place-based-community-organisations-in-disasters-reflections-from-the-well-being-project/

References

PROVIDING VULNERABLE GROUPS WITH EQUAL ACCESS TO EARLY WARNINGS IN AUSTRALIA: A BASIC HUMAN RIGHT

Anuradha Madugalla*, Jonathan Abrahams#, John Grundy#
anuradha.madugalla@deakin.edu.au, {jonathan.abrahams, john.grundy}@monash.edu
* Deakin University # Monash University

Introduction

Early Warning Systems (EWS) are critical in disaster communication as recognised by "EW4All by 2027" (UN/WMO). Most EWS are provided as Apps, which are designed for the average user with a "one-size-fits-all" approach. This can lead to problems such as below.

- **Colour Impaired:** Miss evacuation alerts in red (red-green colour blindness)
- **Elderly**: Struggle with small buttons
- **Wheelchair user**: App may not have ramp exits
- **Person with ADHD**: Bright colour schemes can be disturbing

Such barriers place lives and livelihoods in danger; are discriminatory and a violation of human rights.

Overview

Multi Hazard Early Warning Mobile Apps (MHEW-App)

Vulnerable Communities

Adaptive & Inclusive MHEW App

Method

Co-design approach: "Nothing about us without us"

RQ1: What are the issues and needs of vulnerable groups in using MHEW-Apps?

- Focus groups with disabled
- Workshops with Emergency agencies (VICEmergency, AFAC) - Open for more...

RQ2: How to build MHEW-App to cater the needs of vulnerable groups?

- Develop a prototype based on the collected requirements

RQ3: How to address the needs of vulnerable groups via inclusive EWS?'

- A list of guidelines for future app developers

Results

We are currently conducting focus groups and workshops as well as analysing data.

Impact

List of requirements from disabled community for EWS

Guidelines for developing more inclusive disaster apps

A prototype that visualises the guidelines

Please contact us for further discussions

HUMANISE
MONASH University
DEAKIN UNIVERSITY
EMV EMERGENCY MANAGEMENT VICTORIA
Vision Australia Blindness. Low Vision. Opportunity.

care2 prepare

connecting the dots

Care2Prepare is a phased 3-year project delivered by Carers NSW in partnership with the Physical Disability Council of NSW (PDCN) and aged care service provider GoCo. The project aims to reduce the impact of flood and bush fire and increase the inclusion of people living with disability, older people and carers in local disaster response frameworks. Care2Prepare delivers tailored Household Readiness and Community Readiness support in the Central Coast, Gunnedah and Shoalhaven areas of NSW.

Work in the Gunnedah community to connect individuals, communities and response agencies in an inclusive, collaborative approach to the Prevention, Preparedness, Response and Recovery (PPRR) cycle highlights the importance of 'connecting the dots' to create a person-centred approach to empowering cohorts with specific needs before, during and after a disaster. Connecting two dots is a straightforward task but establishing connections among multiple, dynamic and variable dots is a more intricate challenge.

Preparing people

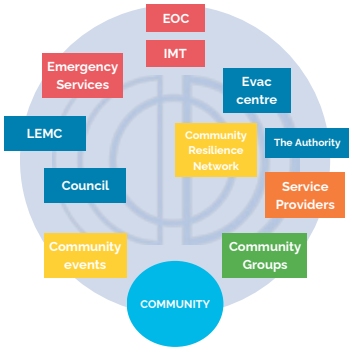
connecting people 2 preparedness

The Care2Prepare Household Readiness Toolkit builds self-reliance by leveraging personal capabilities and strengthens connections with the community and service providers by identifying touch points for individuals in the preparedness and planning cycle. Care2Prepare enhances understanding of emergency response plans and warning systems to help individuals navigate their own prevention, preparedness, response and recovery (PPRR) journey and communicate this with their carer and caring network.

Preparing community

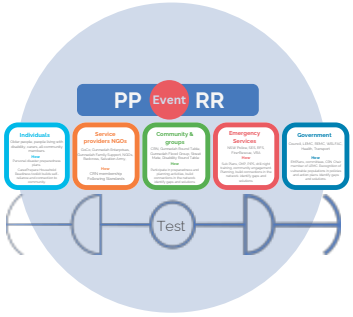
connecting actions 2 organisations

The Care2Prepare team worked with the Gunnedah Local Emergency Management Committee (LEMC) and Community Resilience Network (CRN), response agencies and community to define clear lines of communication and build collaborative partnerships to address complex issues before, during and after a disaster. This connected, inclusive approach builds resilience and strengthens the local Disaster Risk Reduction (DRR) system for the entire community by ensuring everyone is involved in preparing for disasters and aware of each others' roles and responsibilities during an event, so response and recovery unfold simultaneously.



Preparing the system

connecting inclusion 2 outcomes



Testing these connections, through exercising and lessons management identifies gaps and opportunities to enhance the local DRR systems, processes and impacts on the community. This validation process overcomes the disempowering cycle of redirecting acts, policies, and disconnected plans and enables the LEMC and CRN, response agencies and community members to take a person-centred approach to building connections and taking collaborative action in times of crisis. This approach is applied at all stages of the PPRR cycle, and in linking Emergency Management plans and policies, contributing to greater inclusion of cohorts with specific needs and increased community resilience.

This project received grant funding from the Australian Government. For more information visit carersnsw.org.au/care2prepare

Building local government and community resilience by managing systemic bushfire risk in Western Australia

C. Dunne, M. Tierney, J. King and G. Daniel

Rural Fire Division, Department of Fire and Emergency Services (DFES)

The local government Bushfire Risk Management (BRM) program

- Initiative led by the DFES to support local governments to reduce the threat of bushfire across Western Australia (WA).
- The *Guidelines for Preparing a Bushfire Risk Management Plan* (the Guidelines) outline the process to develop a BRM Plan reflecting best practice risk management.

Figure 1 - 95 local governments in the BRM program across WA. Since 2017, a total of nearly $53M from the Mitigation Activity Fund Grants Program has been allocated to 70 local governments to undertake 6,800 bushfire mitigation treatments.

Figure 2 - Systemic risk triggered by a bushfire affects all aspects of a community. At the centre are the direct impacts to housing, industry and critical infrastructure. The subsequent impacts flow through to each outer layer and between all layers. This shows the interconnected networks within a community.

Systemic Risk and the Guidelines

- Risk assessments have historically been asset-based using hazard, exposure and vulnerability factors to identify priority mitigation treatments.
- The 2023 version of the Guidelines now includes a more contemporary approach and new theme - managing systemic risk to build community resilience to bushfire.
- Systemic risk relates to the impacts of an event on the interconnected systems and networks that support communities.
- The concept recognises bushfire can trigger cascading effects through the social fabric, economy and environment of a community.
- These impacts may extend far beyond the initial location of the fire, continue to be felt long after the incident and cause more severe harm than the immediate damage to assets.

Systemic Risk: Putting it into practice

DFES conducted a broad literature review into best practice from Australia and around the world to inform our systemic risk knowledge. We also investigated methods to improve community resilience to reduce the impacts of systemic risk. As a result, a cohort of subject matter experts (SMEs) were interviewed for a case study examination. This provided the data to develop a systemic risk assessment process.

Figure 3 - Steps taken to develop a systemic risk assessment framework and develop a draft systemic risk module for the BRM practitioners workshop

Systemic Risk Workshop: Engaging BRM Practitioners

To implement systemic risk into the Guidelines and BRM plans, DFES sought the advice of BRM practitioners. The outcome was to co-design a systemic risk module that can be used to educate local governments and communities on systemic risk and the interconnectedness of communities.

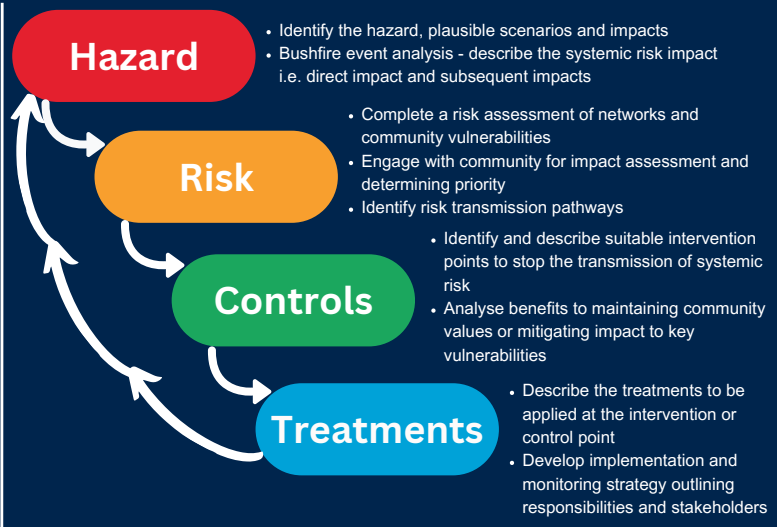


Figure 4 - The Systemic risk framework and module components co-designed with BRM practitioners during the workshop

Systemic Risk workshop outcomes

The workshop with BRM practitioners provided valuable feedback that will be used to improve the systemic risk module including the risk assessment process before piloting it with local governments in WA.

Figure 5 - SWOT analysis from the feedback of BRM practitioners during the systemic risk module workshop

Next steps

FOR A SAFER STATE

ALWAYS ARE

and always will be our

FIRST RESPONDERS

OUT OF THE ASHES

A story about a community's three year battle with bureaucracy to prevent the next bushfire

Government of **Western Australia**
Department of **Communities**

Post-Disaster Evaluation Tool:
Culture, Healing and Wellbeing

The Framework

Identifies both strengths and ongoing challenges in longer-term recovery efforts and can be used at different times to measure the impacts of recovery

The Tool

A suite of questions designed to measure positive or negative responses to calculate a score, measuring outcomes in each domain within the framework

Indigenous leadership and self-determination

Indigenous leadership and self-determination are integral to this evaluation process. The framework is designed to be:

1. Adapted to the circumstances, needs and priorities of individual communities
2. Workshopped with appropriate delegates of communities or an appropriate representative group or organisation
3. Socialised with Indigenous leaders or representative organisations who can assist to interpret and provide meaning and context of the results

DC1561 0724

Work will continue on this partnership project between the Department of Communities (WA) and Bhiamie Williamson.

Non-Indigenous peoples' representations of Indigenous Cultural Fire Management

Gabrielle Miller,[1] Dr Andrea Rawluk,[1] Dr Rebecca Ford[1]

[1] School of Agriculture, Food and Ecosystem Sciences, Faculty of Science, University of Melbourne, Victoria [2]

Exploring non-Indigenous representations of Indigenous Cultural Fire Management (ICFM) and its implications for future integrated fire management

This PhD project will explore the different ways non-Indigenous people perceive ICFM in southeast Australian landscapes. This can help identify the range of possibilities for future intercultural collaborations in land and fire management.

Towards integrated fire management: Current conversations in southeast Australia

Integrated fire management requires ongoing efforts to **challenge the dominance of Western thought** in policy and practice and **build two-way trust and understanding.**

Increasing presence of intercultural fire collaborations between settler and Aboriginal communities across southeast Australia.
Grassroots initiatives highlight potential for bottom-up change.

Calls for research to improve knowledge of the **'other-side'** of **Indigenous-settler relations** to identify **opportunities for social and institutional change**

How are non-Indigenous people are thinking about ICFM?

Where are opportunities for future intercultural collaborations in land and fire management?


Source: REUTERS/Jill Gralow, 2023

Conceptualising diverse & changing perspectives of ICFM

Research Design

Qualitative interviews with non-Indigenous landholders, fire personnel, and members of environmental orgs engaged with knowledge-sharing activities relating to ICFM.

Hoping to better understand:

Social meanings attributed to ICFM

Social construction of ICFM as **'social representations' [SRs]**

Practices, values, ideas

How does this relate to perceived possibilities for intercultural collaboration?

Dynamics of social thought

Shared or contested elements of SRs of ICFM within and across individuals & contexts

Can tensions reveal potential 'entry points' for wider changes in thinking / practice?

Next Steps

In the coming months, I will be recruiting individuals to participate in interviews across East Gippsland, VIC; Southern Grampians, Vic; South Coast/Eurodoballa, NSW.

Further information

For additional information contact:
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The Whisper Networks: Uncovering Community Lifelines in Environmental Disasters

Susan Atkinson,[1] PhD Candidate, NHRA Scholarship Student

[1] News & Media Research Centre, University of Canberra, Australia

Mapping the Hidden Layers: Community Communication Ecologies in Disaster Response

As climate change increases severe weather events, robust emergency responses are crucial. Crisis communication ecosystems grow complex, requiring coordination across official channels and grassroots initiatives. While research explores improving agency collaboration, there's a gap in understanding community-level communication during disasters.

Multilevel info-sharing networks

Emergency services organisations are not necessarily the primary sources of information for people in a disaster. The public often takes an active role when disaster strikes, and affected individuals and groups are sharing information and creating their own informal and formal networks, thus creating multiple levels of information sharing.

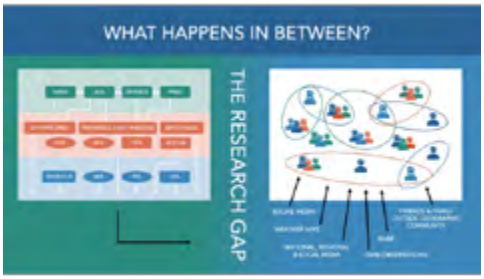
Theoretical Framework

Communication Infrastructure Theory*

CIT provides a holistic view of community communication ecologies focusing on how infrastructures facilitate/constrain information sharing during crises. **Three key components: 1.** Community connectedness; **2.** Communication resources; **3.** Community integration

Methodology

- Qualitative approach, 'grounded theory informed' with 19 interviews across 3 disaster-affected sites
- Purposive sampling of those with visible community response roles



Key Findings

Power of community bonds facilitates rapid informal info-sharing and coordination
Coordinating assistance and pooling of resources through informal networks.

Importance of tangible (Internet, media) and intangible (skills, norms) communication resources
Interweaving these resources creates a comprehensive communication ecology and empowers communities.

Emergent intermediary layer between official communication sources and communities
Complex, dynamic and varies across communities based on many factors.

Key Findings (cont.)

Roles of information intermediaries and community leaders bridging vertical/horizontal communication
Play a crucial role in bridging the gap between official communications and community needs.

Influence of demographics, socioeconomic factors, and past disaster experience
These factors affect community connectedness and integration.

Implications

1. Need for inclusive crisis communication planning
2. Map community communication assets and leverage information intermediaries
3. Foster collaboration between official agencies and community capacities
4. Integrate top-down expertise and bottom-up perspectives

* Kim, YC., & Ball-Rokeach, S.J. (2006). Civic Engagement from a Communication Infrastructure Perspective. *Communication Theory* 16 (2006) pp. 173-197

Further information

For additional information scan the QR code or contact:
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Australian Government

NEWS & MEDIA RESEARCH CENTRE

UNIVERSITY OF CANBERRA

How can collaboration theory help us work better together in recovery?

Louise Mitchell,[1] Dr Jodie Bailie,[2,3] Associate Prof Michelle Villeneuve,[2]

[1] PhD Candidate, Faculty of Medicine and Health, University of Sydney, NSW [2] Centre for Disability Research and Policy, Faculty of Medicine and Health, University of Sydney, NSW, [3] University Centre for Rural Health, University of Sydney.

Better collaboration leads to stronger community recovery. We examined what is known about multi-agency collaboration and propose new ways to think about the organising of shared work.

What did we do?

We conducted a narrative literature review (2024). The question we asked was: **What is known about multi-agency collaboration and how it is studied, that could inform the organising of community recovery work?**

Why is multi-agency collaboration important?

It improves service quality and integrated supports leading to better individual and community recovery outcomes.

What do we know about multi-agency collaboration?

Coordination → Cooperation → Collaboration

Collaboration can be viewed as a form of shared learning that deepens commitment and responsibility to recovery outcomes. When we do it well in recovery, we align our efforts and resources to the supports people need. A challenge is how to navigate teamwork across agencies while efficiently managing resources.

How can collaboration theory be used to inform practice?

Collaboration has been described through a number of lenses: rules and culture; membership; roles; tools, purpose and outcomes. Socio-Cultural Activity Theory (SCAT) uses these lenses to enable the study of the contradictions in teamwork practices.

Researchers immerse themselves in the lived experience of diverse workers to reveal the tensions. Then, they work in partnership with workers, in their team settings, to deliberate on the tensions and find better ways of working. This increases agency for the worker and offers better use of resources, streamlining work practices and outcomes.

Key themes (tensions) from the literature on what affects the organising of collaborative community recovery work

Chaos and Complexity

- The context for decision making is one of chaos and then complexity in the novel dynamic post disaster environment of flux. Tension is inherent in this context.

'Time Compression'

- The pressure to return impacted people to 'normal' quickly and compress many activities into a short period of time creates tension.

Emergence

- Both community and agency decisions and action emerge in the unique context after a disaster, requiring agility to manage diverse roles, resources and decision-making before an overarching view can be understood.

Empowerment

- Listening and responding to communities and actualising community participation for resilience through the governance structures that are organising the work is difficult.

Integration

- The quality of shared learning and building shared knowledge between agencies is key to the effective organising of collaborative work.

For further information:
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lmit8455@uni.sydney.edu.au

Understanding conflict in disaster recovery collaborations

Danielle O'Hara [1]

[1] PhD student, School of Political Science and International Studies, University of Queensland

What causes conflict between agencies working together in recovery?

In disaster recovery, collaboration between different agencies, including levels of government and NGO's, is essential. Yet working together can be difficult and is often characterised by conflict. This research investigates the causes of conflict so it can be managed more effectively.

Background

Despite being touted as a "magic bullet" for addressing complex societal issues like disaster recovery, collaborative partnerships can be fraught with challenges and conflict. Paradoxically, collaboration can increase the potential for conflict by bringing together organisations with divergent interests, knowledge, practices, and values to contribute to decision-making. Conflict can be constructive. However poorly managed conflict can stall decisions, cause harm, and lead to the community missing out on funding, resources or support.

Methodology

Semi-structured interviews were conducted with 38 recovery practitioners from five Australian jurisdictions. Participants were concentrated in areas that had experienced recent or frequent disasters. Participants represented diverse organisational types: local government, state government , local NGOs and community organisations and large national NGOs Many had worked for various organisations in recovery.

Participants were asked about their experiences of conflict in recovery collaborations before, during and after disasters, and to take an 'organisational perspective' that did not limit responses to specific events or individual grievances. Each participant was asked to describe how eight categories influenced the conflict they described. The categories were based on conflict analysis and existing disaster recovery research.

Selected findings

The research found that recovery workers have a shared goal of supporting the community and a deep commitment to collaboration.

However, four interrelated primary factors cause conflict within disaster recovery collaborations:

- Perceived value differences.
- The structure of the recovery system, including governance, role clarity and funding.
- Organisational interests, including organisational reputation and survival.
- Relational dynamics, including history and stereotypes.

Workers from different types of organisations described similar causes of conflict, but from different perspectives.

Some of these factors exist pre-disaster, while some are exacerbated by the complex environment and stressful nature of working in recovery.

Next steps

Based on this research, tools will be developed for disaster recovery practitioners to better understand conflict in their collaborative relationships.

Future research will investigate how conflict in disaster recovery collaborations can be better managed.

Further information

For additional information scan the QR code or contact:

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Reflections FOR THE FUTURE

A place-based verbatim theatre project, developed with an inclusive multimedia approach on Gumbaynggirr Country (Coffs Harbour NSW), following 5 years of floods, fires, hailstorms, pandemic and drought. The community live with the memory of these traumatic events, and a maintain a fine balance of resilience and hope, alongside anxiety and concern about what the future holds.

The process

11 community members - our 'Contributing Storytellers' - were interviewed by an art therapist about their experiences of disaster, and asked questions about hope, resilience and community.

7 verbatim monologues were developed by a playwright, using the interview transcripts from the Contributing Storytellers. Each monologue is a new story, formed as a composite of multiple interviews.

These monologues were performed in an audio format by disaster impacted young actors (aged 12-20) from the Coffs Coast. They'd experienced evacuations during fires, extreme home damage during the super cell hailstorm, and had housed friends or family during fires.

The monologues were also performed on film by disaster impacted members of the local Deaf Community, with the support of an Auslan interpreter. These performances are unique interpretations of the monologues, providing alternate depth and character.

The performances were combined, and first screened in 2024. The audience was invited to engage with the performance with varying levels of sensory input:

1. Watching in silence with subtitles
2. Watching with audio
3. Listening, while masked

The monologues, final performance and project are available for communities to replicate or adapt, under creative commons license. We hope that more communities will undertake this process, and add their own, new, Reflections for the Future.

The Why and the Goal

Luke Barbagallo conceived this project following over three years of recovery work with the communities of the Orara Valley, Coffs Coast and Bellingen regions.

Over hundreds of conversations at community meetings, events, workshops, street stalls and recovery assistance points, residents of these areas shared stories of courage, resilience and hope. These kinds of stories often go unheard, are lost in the bureaucracy of government-led recovery, or are simply not shared until someone asks "**How were you impacted by disaster?**", "**What has been your experience of recovery**?", "**Has this experience changed your perspective on the future?**" or "**How would you define hope, based on your experiences?**".

The goal of this work was to share raw stories of everyday resilience, and evoke empathetic reflection from audiences. By using audibly young voice actors and Auslan performers, we are invite audiences to consider some of the often forgotten members of our community; the young, who are disaster impacted today, and will be increasingly impacted by disasters over their lifetime; and people with disability, who have diverse additional support needs before, during and after disaster, needs which are frequently unmet by normative approaches to disaster management.

It is our hope that this work, which showcases the intangible value of community bonds and cohesion, prompts audiences to reflect on this question, with the future in mind;

How can my yesterdays prepare me for tomorrow's disasters?

Acknowledgements

The Reflections for the Future team acknowledges the traditional custodians of the land on which this work was conducted, the Gumbaynggirr people, who have cared for the land since time immemorial. We pay our respects to their elders, past, present and emerging, and acknowledge their ongoing connection to, and care for, Country.

This work would not have been possible without the participation, honesty, vulnerability and informed consent of our Contributing Storytellers. On behalf of the team, we extend our deepest gratitude to them for trusting us to share their stories.

This work was performed by talented locals from the Coffs Coast, and without their commitment and talent, this project would not have been realised. A heartfelt thank you goes to our Young Performers, and our wonderful Deaf Performers, and our interpreting team.

This project was funded by the NSW State Government through the Community Recovery Officer (CRO) Program as part of the recovery to the 2021 and 2022 Floods in our region.

Watch it here!

Access the playbook and project information, and watch the performance recordings via the QR code or at type www.reflectionsforthefuture.org into any browser.
If you'd like to publicly screen or replicate this work in your community, reach out to us at reflections4thefuture@gmail.com

Special Thanks

This project was supported by a team of valued professionals and co-designers, including Luke Barbagallo (producer & creator), Amy Bradney-George (playwright & director), Miranda Baldwin (interviewer), Terri-Anne Richardson (Auslan interpreting), Mark Taylor (audio production) and Matt Evans (videography & post production), Sam Howland (Design) and Dani Hunt (Website).

Social Recovery Reference Group
AUSTRALIA

WHAT SHOULD GOVERNMENT CONSIDER IN ORDER TO IMPROVE PLANNING AND DECISION MAKING FOR ACCOMMODATION NEEDS AFTER A DISASTER, AND TO SUPPORT PEOPLE'S TRANSITION TO STABLE HOUSING?

The report was commissioned by the Social Recovery Reference Group and undertaken by Esther Charlesworth and John Fien through the Royal Melbourne Institute of Technology. The findings and recommendations may be utilised by stakeholders.

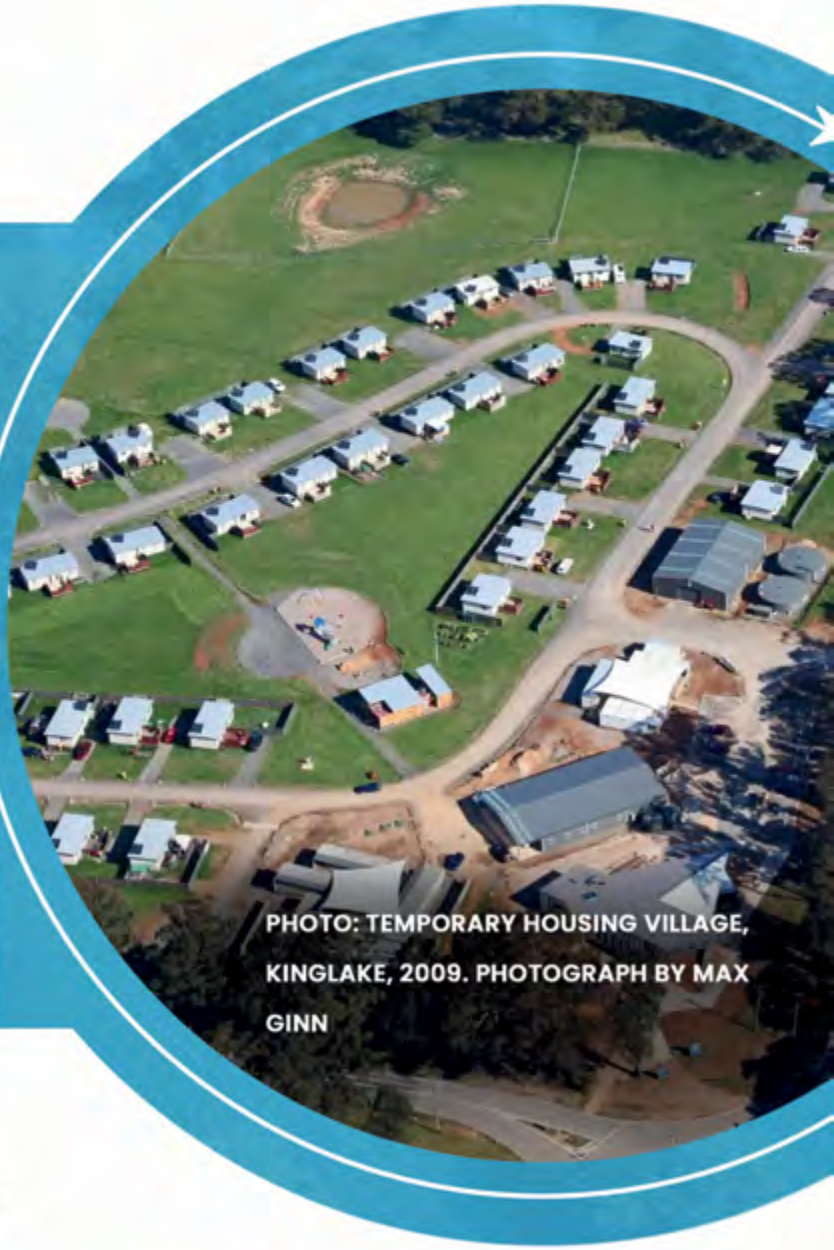


PHOTO: TEMPORARY HOUSING VILLAGE, KINGLAKE, 2009. PHOTOGRAPH BY MAX GINN

PURPOSE

There are currently significant challenges in supporting displaced people with timely and equitable access to emergency and temporary accommodation and assisting them on a path to stable housing in the aftermath of a disaster. This report seeks to support agencies and decision makers to formulate and implement appropriate approaches to post-disaster housing, factoring in the scale of a disaster and varying community cohorts.

FINDINGS

1. Leading practice in disaster housing recovery

The analysis of leading practices in housing recovery led to the development of a checklist of actions that could be used to identify appropriate actions by housing recovery officers and their agencies in providing and managing emergency and short-term accommodation and temporary housing.

2. Innovative approaches to temporary housing

Innovative approaches to effective temporary housing practices are based upon the concept of resilient housing recovery, which has at least five dimensions: Wellbeing, Liveability, Sustainability, Community Connection, and Viability.

3. A decision-making framework for resilient housing recovery

The Framework seeks to integrate the steps in project management and to use the housing process as a lever for overall recovery. This involves aligning decisions at strategic and operational levels and managing the trade-offs between issues of location, tenure, housing types and procurement.

RECOMMENDATIONS

1. Terminology
2. Post Disaster Temporary Housing Principles
3. National Principles for Disaster Recovery
4. Guidelines
5. Capacity Building
6. Funding
7. Further Research
8. Pilot Project
9. Decision Making Framework
10. Capturing Learnings

NEXT STEPS

The Social Recovery Reference Group is partnering with Natural Hazards Research Australia to analyse previous post disaster temporary housing assistance and support mechanisms used in Australia. The project aims to provide national guidance on the design and implementation of temporary housing from the research and resources developed.

Catherine.gearing@reconstruction.nsw.gov.au

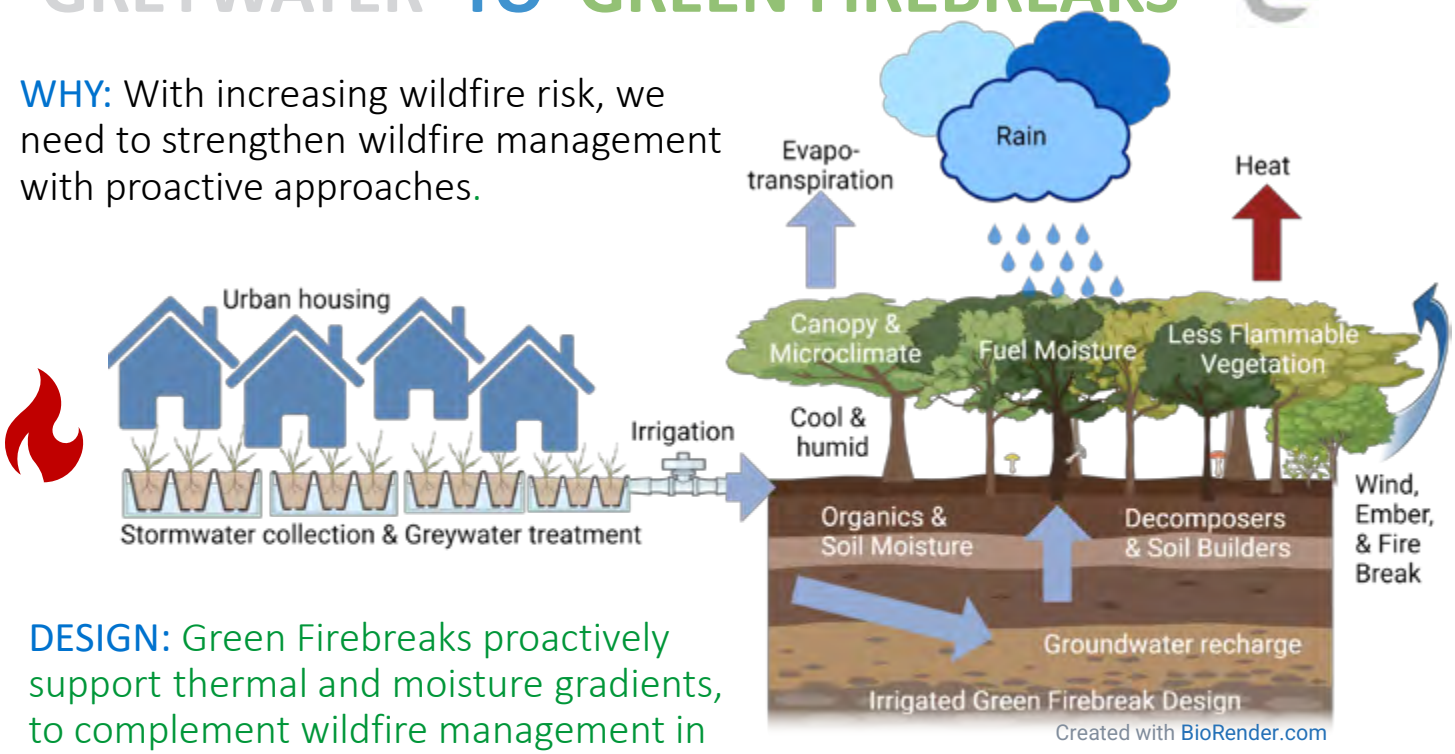
Irrigated Green Firebreaks Complement Wildfire Management in the Wildland Urban Interface

Natural Hazards Research Australia

Jady Smith
Forest Research Institute, University of the Sunshine Coast, Queensland
Supervisors: Professor Mark Brown, University of the Sunshine Coast Director, Forest Research Institute, Director, Forest Industries Research Centre, Professor of Forestry Operations; and Director, Australian Forest Operations Research Alliance (AFORA)

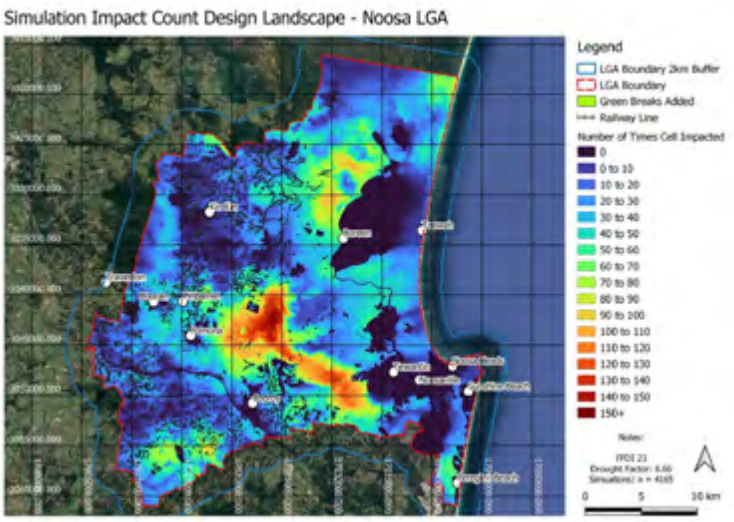
GREYWATER TO GREEN FIREBREAKS

WHY: With increasing wildfire risk, we need to strengthen wildfire management with proactive approaches.

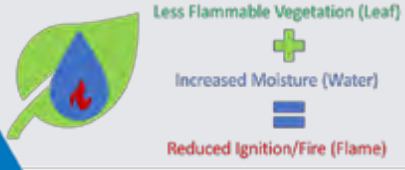


DESIGN: Green Firebreaks proactively support thermal and moisture gradients, to complement wildfire management in the Wildland Urban Interface; with water reuse stopping vegetation from becoming fuel in extreme droughts.

HOW: CSIRO Spark software will be used to analyze fire simulation scenarios across Noosa's Wildland Urban Interface, with (design) and without (control) Irrigated Green Firebreaks.



Riparian Green Firebreaks (Int'l River Symposium - Power & Smith 2022)



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https://www.usc.edu.au/research/forest-research-institute

Design Principles for Nature-Based Alternative-water Treatment Landscapes

Anna Louise Durkin (PhD candidate),[1] Prof John Fien,[2] Prof Felicity Roddick,[3]

[1] School of Architecture & Urban Design, RMIT University, Victoria [2] School of Architecture & Urban Design, RMIT University, Victoria
[2] School of Engineering, RMIT University, Victoria

Nature-based Alternative-water Treatment Landscapes (NATL) in New Urban Fringe Development

Alternative-water landscapes create potentials to mitigate some of the urban landscape impacts from climate change, including the effects of Urban Heat Island (UHI). Design Principles are needed to guide consideration and implementation of NATL.

Urban context

Climate change effects will impact new urban fringe development.

Many cities and regional towns across Australia are developing new urban growth areas to accommodate population increases. For example, in Melbourne, 60,000 houses are proposed to built in the next decade within these growth areas (State of Victoria, 2023). In the west of Melbourne, UHI will continue to be an issue if there is not careful consideration of green infrastructure provision and climate independent water source options.

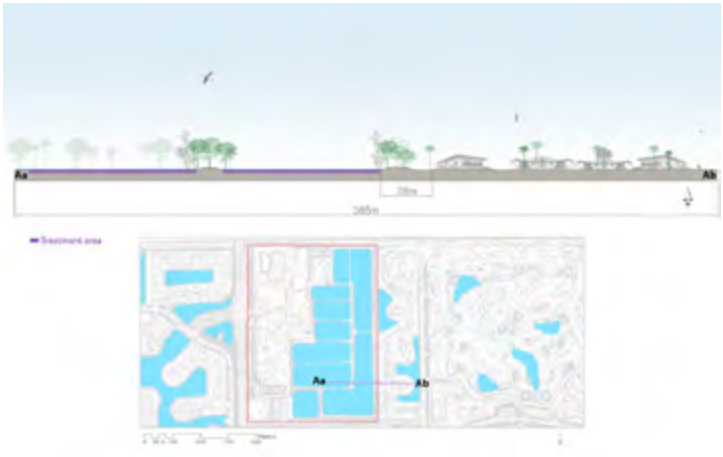

Image: section of the Wakodahatchee wetlands, Florida, U.S.A. showing proximity of the treatment area to housing. The wetlands are a successful example of a NATL, which is also a bird-watching location that attracts many thousands of tourists every year. (Image source: Durkin et al., 2023).

Alternative-water and Green Infrastructure

Nature-based approaches such as NATL provide a local source of climate independent water by treating partially treated wastewater or greywater through landscape-based methods. These landscapes can also be designed to accommodate stormwater. Associated co-benefits of NATL include grass-fire deterrence, biodiversity enhancement, low-energy use, low-chemical inputs, and landscape therapeutic qualities.

State of Victoria. (2023). *Victoria's Housing Statement | vic.gov.au*. State of Victoria. https://www.vic.gov.au/housing-statement

Design Principles for NATL

Design principles for NATL were devised after a literature review and a precedent analysis of alternative-water treatment landscapes from across the world.

The principles are: **1.** Employ nature-based solutions. **2.** Treat water to a standard where it is fit for purpose. **3.** Use free-water surface flow methods where possible. **4.** Consider partial decentralisation. **5.** Minimise harmful inputs. **6.** Seek to create a best practice (or demonstration) project in collaboration with local or state government and local water companies. **7.** Maximise co-benefits. **8.** Seek extensive landscape footprint and contexts.

In the next phase of research, these principles will be discussed with stakeholders related to alternative-water treatment landscape infrastructure to gain insight and feedback

The journal article associated with the work shown on this poster is:

Durkin, A. L., Roddick, F., & Fien, J. (2023). Nature-based alternative-water landscapes for water security and green space health. *Blue-Green Systems*, *5*(2), 275–293. https://iwaponline.com/bgs/article/5/2/275/99203

Further information

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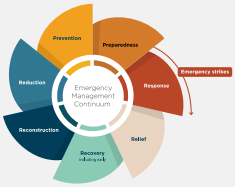
Australian Government

RMIT UNIVERSITY

Impact of disasters on vulnerable populations



Some groups are more vulnerable to the effects of disaster events~

Disasters impact on people regardless of their background, ethnicity, age and demographic characteristics. The weight of impact can be 'profoundly discriminatory', with vulnerable populations the most adversely affected (Australia Institute of Disaster Resilience, 2018).

Picture of Australia today: Who are the vulnerable populations

Culturally and Linguistically Diverse (CALD) indicators in Australia

ABS Census, 2021

3.4%	9%	27.6%	22.8%
Low proficiency in spoken English (LEP)	Arrived in the last 10 years	Born overseas	Language other than English spoken at home

Disability within Australian population

ABS, 2021

1 in 6	22%	23%
Australians live with a disability (18%)	Of persons have a long term health condition (no disability)	Of persons with a disability need an assistance with mobility

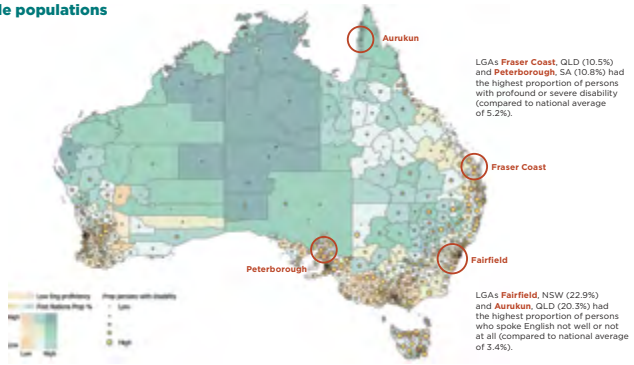
Disability within First Nations populations

AIHW, 2021

24%	8.8%	1.9 times	2 times
of the First Nations population have a disability	of the First Nations population are estimated to have a severe or profound disability (51,100 persons)	more likely to have a disability than non-Indigenous persons	more likely than non-Indigenous persons to require support meeting self care, communication or mobility needs

Where are the vulnerable populations

Distribution of vulnerable communities in Australia by Local Government Area (LGA) displays close relationship between low English proficiency and high proportion of First Nations populations.



LGAs **Fraser Coast**, QLD (10.5%) and **Peterborough**, SA (10.8%) had the highest proportion of persons with profound or severe disability (compared to national average of 5.2%).

LGAs **Fairfield**, NSW (22.9%) and **Aurukun**, QLD (20.3%) had the highest proportion of persons who spoke English not well or not at all (compared to national average of 3.4%).

Vulnerabilities are present in all aspects of the disaster continuum.

Preparation

Vulnerable communities, such as the elderly, disabled, low-income, and minority populations, must prepare for disasters in tailored ways that address their unique needs and challenges to ensure their safety and resilience.

Assistance with core activities by English proficiency

Persons from culturally and linguistically diverse backgrounds may face barriers during disaster events and this can create further challenges for persons who also have disabilities or are from low socioeconomic backgrounds.

% of people requiring assistance with core activities in Australia

17.8%	15.4%	10.4%	25.9%	19.2%
LEP claimed the aged care pension (3.5%*)	LEP have suffered a stroke (1%*)	LEP suffer from diabetes (4.7%*)	of people born in Southern and Eastern Europe suffered stroke	LEP did NOT claim government assistance (43%*)

* English Speaking population

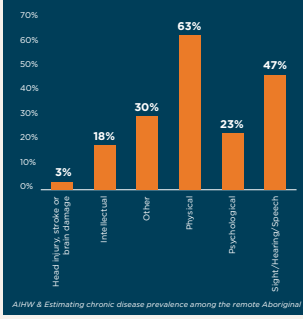
ABS Census 2021

Individuals with LEP (Low English Proficiency) are twice as likely to require assistance with core activities in comparison to English speakers.

ABS, 2021

Analysis of long term illness and government support data demonstrate individuals with LEP are more likely to access government payments. In addition individuals with LEP are more likely to suffer from a variety of late onset diseases.

Proportion of disability type for First Nations Australians aged 15 and over with disability

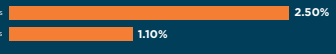


Under-diagnosis in First Nations communities

Studies have shown there is a considerable under-diagnosis of preventable chronic disease in First Nations communities. An independent study conducted in NT found that the prevalence of kidney disease in First Nations communities was almost double the observed rate from clinical data sources (13.7% observed vs 25.2% actual).

Persons with kidney disease are particularly vulnerable to natural disasters.

Percentage of total burden of disease* accounted for by Chronic Kidney Disease



This under diagnosis can be attributed to a number of reasons. In many First Nations language groups, there is no equivalent word for 'disability' or for many specific disabilities. There is also a cultural barrier in which certain attitudes results in First Nations people living with disabilities to not self-identify as having one.

* Burden of disease measures the impact of disease and injury by estimating the years of life lost and years lived with disability

AIHW & Estimating chronic disease prevalence among the remote Aboriginal population of the Northern Territory using multiple data sources, 2008

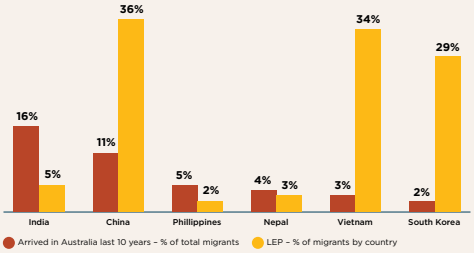
First Nations Languages

ABS, 2021

First Nations language being used at home and LEP are moderately correlated (based on percentage of persons in an LGA). In 18 LGAs across Australia, a First Nations language is used at home by more than half of all people in the LGA.

9.5%	10%	Over 150
of First Nations people speak a First Nations language at home	of those who spoke a First Nations language at home reported LEP	First Nations languages were spoken in Australia in 2021

Recent migrants by country of birth (COB)
Top non-English speaking COB and key COB with LEP



ABS, 2021

Recently migrated persons born overseas may require additional support due to language and communication barriers.

English proficiency may play a role in inadequate insurance against disasters.

Insurance Council of Australia (ICA) found that insurance expenditure was lower among those from non-English speaking countries. Affordability and cultural understanding may act as barriers in obtaining adequate coverage as bushfire prone urban fringes are also increasingly populated by low income earners as well as households where English may not be the first language.

ICA, 2015, Booth. et al, 2015

Response

During emergencies, vulnerable groups require specialised support and resources to ensure their safety and recovery.

After evacuation

Persons who require dialysis can be particularly vulnerable as they require access to electricity and fresh water. **15,200** people with kidney failure received dialysis in Australia in 2021.

Adults with disability are also more likely to experience high or very high levels of psychological distress than adults without **(32% compared to 8%)**.

AIHW, 2021

Gender and fatalities

Australian Deaths by Forces of Nature (2022)*

Australian natural disaster fatalities show more male victims, contrary to global trends. In low-income countries, **women are more likely to die in disasters**, as seen in the 2004 Indian Ocean Tsunami where they comprised 80% of fatalities in some areas, partly due to restrictive clothing. However, in high-income countries like Australia, **men are more likely to die**, partly due to their overrepresentation in emergency services. For instance, females make up only 7% of Australia's Fire and Emergency workforce.

* Due to environmental conditions. This includes exposure to too much natural heat or sunlight, natural disasters, and lightning strike

ABS 2022, World Bank, 2021, AIDR, 2013, ANZCO, 2023

The importance of recognising First Nations culture in Disaster Response

Recognising and respecting the resilience of local processes in everyday First Nations life is central to ensuring local cooperation and effective involvement of state and national institutions in delivering effective measures during emergencies. The significance of cultural awareness is further emphasised by the presence of language barriers. **10%** of all individuals who reported as speaking a First Nations language also reported as having low English speaking proficiency. Tailoring evacuation procedures to address language needs is crucial for providing equitable disaster response.

AIDR, 2018, ABS 2021

Recovery

In the aftermath of disasters, vulnerable groups may need to navigate a longer, more complex path to recovery.

Various studies (global and Australia based) have found an **increase** in violence against women in natural disaster impacted areas.

- New Zealand reported a **53% increase in domestic violence** after the Canterbury earthquake.
- The US had a **98% increase in physical victimization of women** after Hurricane Katrina.
- In Australia, research in this space heavily centered around the impacts of bushfires. A study in 2020 found there was an **increase of 7.4% in higher bushfire exposure areas**. This increased in lower income areas.

Molyneaux R et a, 2019, Parkinson 2013

Snapshot: Mental health and the agriculture industry

Only **6%** of people working in the agriculture industry identified as having a long-term mental health condition (including anxiety and depression) in 2021. However, a 2023 survey of farmers showed **30%** had attempted self-harm or suicide and 14% had frequent feelings of anxiety and/or depression. Natural disasters were the top factor identified as affecting farmer's mental health.

Percentage of people identifying as having a mental health condition
Comparison of highest and lowest industries

Agriculture, forestry and fishing; mining; construction; transport, postal and warehousing **6%**

Retail trade; public administration and safety; education and training; health care and social assistance; arts and recreation services **11%**

In general, industries that have a **high proportion of male workers** saw fewer people identifying as having a mental health condition.

67%	50%
of people working in the agriculture industry are male	of people working in the agriculture industry are over 50 years old (highest of all industries)

ABS Census, 2021 & National Farmer Wellbeing Report, 2023

Leading practices in inclusive emergency management

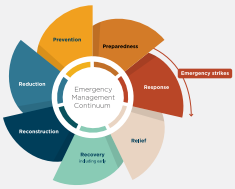
Inclusive emergency management requires tailored practices, accessible information, traditional knowledge incorporation, and meaningful participation of marginalised groups. Implementing these practices can create a more equitable emergency management system.

Following the 2011 Christchurch earthquakes, New Zealand improved engagement with CALD communities by translating emergency information into 24 languages and providing foreign language radio broadcasts.

The Sendai Framework for Disaster Risk Reduction 2015-2030 emphasises gender considerations, recommending sex-disaggregated data, gender-inclusive policies, and improved communication to challenge stereotypes. By implementing leading practices, Australia can create a more equitable emergency management system.

NZ Government "Get Ready", 2023, NZ Civil Defence, 2013, Sendai 2023

Disability Inclusive Emergency Management: Principles and Practical Action Guide



The Disability Inclusive Emergency Management Principles and Practical Action Guide aim to develop capabilities and advance excellence in disability inclusive emergency management planning and practice.

Key Messages

- **Nationally consistent policy** is needed to remove the barriers that people with disability experience in emergencies.
- **Co-designing** with people with disability creates more inclusive and effective emergency management for everyone.
- **Person-centred and capability-focused** approaches to inclusive disaster risk reduction are grounded in international human rights treaties which underpin the principles.
- **Adopting human rights-based approaches** can support leadership in policy and practice towards disability inclusive emergency management information, planning, and practices that leave nobody behind.
- **Using Practice Standards focused on growth and shared responsibility** will support application of disability inclusive emergency management, improving the safety and wellbeing of all Australians with disability.

Principles

1. Autonomy and Safety
2. Person-centred and Strengths-based
3. Non-discriminatory and Collaborative
4. Diversity, Representation and Inclusion
5. Accessibility and Quality
6. Learning and Capacity Development
7. Data and Evidence

Effective disability inclusive emergency management relies on government and emergency services personnel learning the Principles and working together with people with disability, their families, service providers, and communities so that everyone is prepared and included.

Maturity Development and Reporting Framework

This integrated framework prioritises a cohesive approach to maturity development and reporting, focusing on three interrelated Practice Standards that form the foundation of disability inclusive emergency management.

Embedded within these standards is a maturity model and Practical Action Guide that serve as a compass to guide organisations from their current practices to aspirational maturity levels of inclusive preparedness, response, and recovery planning.

The Framework does more than just delineate best practices; it offers a roadmap for development, emphasising a uniform application of the Principles across the continuum of emergency management.

Maturity Levels

Initiate:
We are in the process of establishing the foundation for disability inclusive emergency management plans and practices.

Develop:
We are actively developing formal processes and procedures for implementing and documenting disability inclusive emergency management plans and practices.

Lead:
We have embedded formal processes and reporting mechanisms for sustained cross-sector action on disability inclusive emergency management planning and practice.

Self-assessment Process

Six steps guide emergency planners to engage with the integrated Maturity Development and Reporting Framework and Practical Action Guide to advance practices in disability inclusive emergency management.

1. Understand the Practice Standards and Maturity Levels
2. Assess current state
3. Develop an action plan
4. Implement and collaborate
5. Evaluate and improve
6. Document and communicate progress

The Principles, Maturity Framework and self-assessment tools form a robust mechanism that measures progress whilst incentivising the pursuit of excellence in disability inclusive emergency management

The National Emergency Management Agency (NEMA) commissioned the Disability Inclusive Emergency Management project with the Collaborating4Inclusion research team at the University of Sydney Centre for Disability Research and Policy.

For more information contact **social.policy@nema.gov.au**

Telehealth for rural kids:
Post-disaster recovery

Tracey Parnell[1], Tayla Iellamo[2], Michael Curtin[1], Donnah Anderson[1], Mehdi Rassafiani[1], Sarah Eagland[2]

1 - Charles Sturt University,
2 - Royal Far West

Many communities across Australia experience compounding disasters. Experiencing disasters of this nature can have an ongoing impact on a child's emotional wellbeing and development. Children and those living in regional, rural and remote areas are disproportionately impacted given the other disadvantages they face, such as limited access to health care, and a higher likelihood of having developmental vulnerabilities[1].

Royal Far West designed the Community Recovery Services to support the wellbeing and resilience of young children impacted by disasters in rural areas to reduce the likelihood of long-term adverse effects. Charles Sturt University conducted a two-year independent evaluation to evaluate the effectiveness of the use of telehealth to support the recovery and health and wellbeing of children impacted by the 2019/20 Black Summer bushfires. 135 children in regional, rural and remote areas of NSW were included in the evaluation and participated in individual occupational therapy, psychology and/or speech pathology telehealth sessions.

Evaluation key findings

Psychological therapy was found to improve children's mental health. The evaluation found a statistically significant improvement in mental health as measured by the Strengths and Difficulties Questionnaire (SDQ) for children who received psychology teletherapy. Most significant was the improvement in emotional symptoms; and conduct problems.

86% **Overall, 86% of children attained or exceeded their OT and speech pathology telehealth goals.**

85% **Parents/carers were very happy and positive about the telehealth program with 85% indicating it was high to extremely high quality and felt that their child benefitted from participating in the sessions.**

73% **73% of parents/carers indicated that there was a large or very large improvement in their child's participation and/of function due to telehealth sessions**

71% **71% of parents/carers reported that their child's emotional regulation and coping strategies to deal with adversity had improved to a large or very large amount due to telehealth sessions.**

What did the children say?

89.3% of children stated: ***"Always felt listened to"***

86.5% of children reported: ***"I can do things to help make me feel better"***

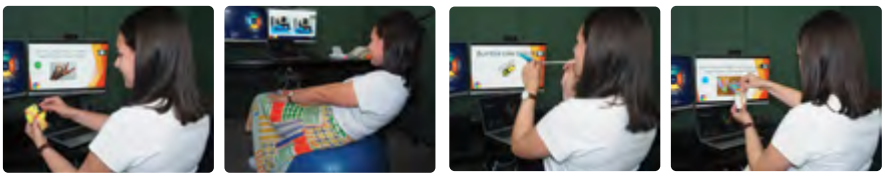
84% of children expressed they: ***"Enjoyed the sessions a lot"***

KEY FINDING: Children who attended teletherapy sessions overwhelmingly indicated that they felt listened to, enjoyed the sessions, and learned new ways to feel better.

A total of 75 children completed satisfaction survey following their teletherapy sessions

Key lessons to telehealth success

OT telehealth in action



Telehealth reduces barriers

Parent/carers reported experiencing barriers to accessing health services for their children locally, most commonly relating to cost, long waiting times and travel distance. The telehealth services were felt to provide "quick" and easy access to allied health appointments to address some barriers faced in the communities.

"I mean for us I found it really good, just being in a rural area like this is really tough to get any kind of help. We were in need of help before the bushfires came [...] when this program came out we just jumped on board straight away."
Parent

Conclusion

Occupational therapy, psychology and/or speech pathology telehealth can be an effective strategy to support children's mental health, recovery and goal achievement following a disaster such as bushfire. It offers children in geographically remote areas access to professional supports not immediately available in their local communities.

Reference 1. (Royal Far West and Charles Sturt University, 2020).

The project work referred to in this presentation has been funded by a Bushfire Local Economic Recovery Fund Grant, jointly funded by the Commonwealth and the New South Wales Government under the Disaster Recovery Funding Arrangements Although funding for this project has been provided by both the Australian and NSW Governments, the materials contained herein does not necessarily represent the views of either government.

FIND OUT MORE

From textbook to practice: Applying the five essential elements of disaster recovery

Tracey Parnell[1], Sarah Eagland[2], Tayla Iellamo[2], Michael Curtin[1], Donnah Anderson[1] and Mehdi Rassafiani[1]

1 - Charles Sturt University,
2 - Royal Far West

The climate crisis is the defining challenge of our time

Children and young people are uniquely vulnerable to accelerating climate change and environmental degradation.

More than 1.4 million Australian children and young people are experiencing a disaster or extreme weather event in an average year[1],

and those in remote areas are more likely to be impacted. Without the right support the consequences can change the trajectory of children's lives, reducing education, employment and psychosocial outcomes immediately and long after the event has passed. Royal Far West's (RFW) Community Recovery Services were developed to support the wellbeing and resilience of children impacted by disasters and to reduce the likelihood of long-term adverse effects.

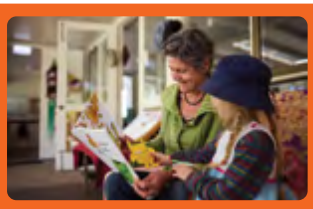
Alignment to the five essential elements of disaster recovery

The framework of five essential elements that should be considered in any community trauma or disaster response (Hobfoll et al., 2007) was used to guide the design, development and delivery of the services. 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.

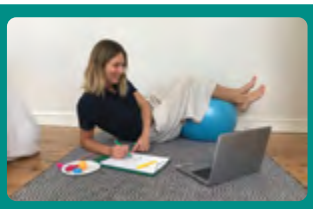
Five Essential Elements of Disaster Recovery

Charles Sturt University conducted a two-year independent evaluation of the services to identify the evidence of embedding Hobfoll et al.'s (2007) five essential elements within the design and delivery of the services. The evaluation involved analysis of the service model, surveys and interviews with children and parents/ carers.


Children's groups in school & preschool


Educator support


Parent/carer support


Individual telehealth therapy

Community Recovery Services in action

The five essential elements	Examples of how Royal Far West applied the principles in practice	What parents and kids told us
Promote a sense of safety – Feel safe	▸ A multidisciplinary team trained in trauma informed interventions and with specialist skills in grief and loss ▸ Facilitating individual professional development sessions with educators focused on creating safe classroom spaces for children to learn and grow post-disaster ▸ Embedding trauma informed care principles into individual and group therapy sessions with parents and children.	*They helped me to get the courage to speak about my emotions. It's OK to say stuff you're sad about. (Pebbles, 9 years)* *It was a safe place to share. (Parent 5)* *The facilitators made me feel validated, comfortable. They were non-judgemental. (Parent 7)*
Promote calming – Feel calm	▸ Teaching targeted strategies for children participating in group and individual therapy sessions such as mindful breathing. ▸ Emotional coaching strategies provided in the trauma-informed Tuning in to Kids® parenting program to develop understanding of fight/flight/freeze responses in themselves and their child.	*I learned about how to finger breathe where you trace the outline of your finger and when you go up you breathe out, and then down breathe in, and then go up, and down until you get to your last breath. It usually helps me calm down when I'm stressed or angry. (Oliver, 9 years)* *Assisted me to pause, reflect, validate and problem solve with my children, to recognise there is an emotion, validate it, say it and problem solve together. (Parent 3)*
Promote a sense of self-efficacy & collective efficacy – Have control over what occurs around them	▸ Child involvement in goal setting to identify what is most important to them to work through in individual therapy sessions. ▸ Activities in the trauma-informed Tuning in to Kids® parenting program to assist in identifying and naming their own emotions and to assist their children to do the same. ▸ Disaster preparedness activities targeted for children. ▸ Child's voice and feedback included in the services' evaluation.	*We learnt like about stories about the bushfires and how we could help. (Scout, 9 years)* *It was a self-learning thing. I didn't realise how much I was going to learn about me. (Parent 6)* *I have definitely learned better ways to help them [children] cope. And better ways for me to cope. (Parent 4)*
Promote connectedness – Feel connected to others	▸ Working with all the adults around a child, delivering individual & group sessions with educators and parents/carers to facilitate connection with children who may be experiencing distress. ▸ Activities delivered to school groups to promote connectedness such as daily group circle, sharing memories and experiences. ▸ Tuning in to Kids® delivered online bringing parents together who share similar experiences parenting post-disaster. ▸ Facilitating community engagement activities to connect families, educators and local service providers.	*I learnt that a lot of other people probably have anxiety, like the same problem as me, so it makes me feel less lonely, like I'm not the only one who has this. (Oliver, 9 years)* *It was a really safe place and everyone was sharing not holding back and feeling like it was really supportive. I think hearing everyone else's experiences helps you with, well you think you are not alone. (Parent 5)* *It really helped with our relationship. It's brought us closer together, all of us. (Parent 1)*
Instil hope – Be hopeful about the future	▸ Activities delivered to school groups to promote hope such as planning together and exploring how people grow and change. ▸ Content provided in the trauma-informed Tuning in to Kids® parenting program to assist with planning for the future.	*I'm nervous about the future, but also excited. (Kevin, 11 years)* *It gave me hope for our family, to be closer and to be more connected. And hope that we can pass these little ideas on to our own friendships and family. So, I'm hoping that they, especially the kids, can carry that through into their own families and you know, make it a better world. (Parent 1)*

Bushfire evaluation

Hobfoll article

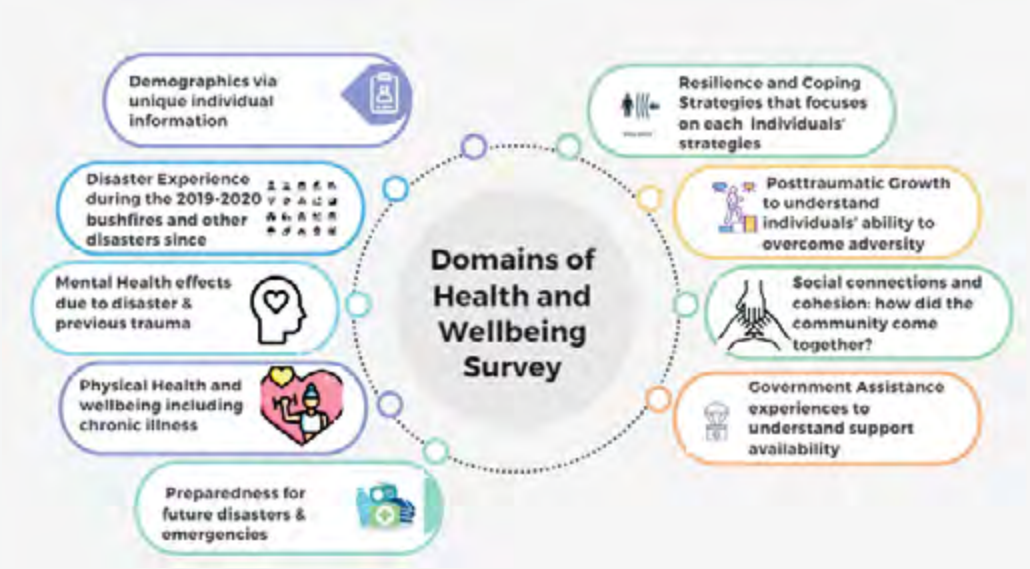
Conclusion

Underpinning RFW's Community Recovery Services with Hobfoll et al.'s (2007) five essential elements has contributed to affected children and parents feeling safe and calm, having a sense of control over what occurs around them, feeling connected to others, and feeling hopeful about the future. These elements provide a strong foundation for the planning, development, implementation and evaluation of post-disaster recovery services.

The project work referred to in this presentation has been funded by a Bushfire Local Economic Recovery Fund Grant, jointly funded by the Commonwealth and the New South Wales Government under the Disaster Recovery Funding Arrangements Although funding for this project has been provided by both the Australian and NSW Governments, the materials contained herein does not necessarily represent the views of either government.

CO-DESIGNING A COMMUNITY HEALTH AND WELLBEING SURVEY FOLLOWING THE 2019-20 BUSHFIRES

FIRE to FLOURISH
Strength through community-led action



AUTHORS

Dr Julie Willems, School of Rural Health, Monash University
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Mr Karan Varshney, SPHPM, Monash University
Prof Jane Fisher, SPHPM, Monash University

SPECIAL THANKS

We would like to thank participants who gave us their time and valuable insights towards the development of a Health and Wellbeing survey following the 2019-2020 bushfires.

WHAT WE DID

We invited community representatives with diverse backgrounds who were living or working in bushfire-affected areas to help design a survey to understand the health and wellbeing of communities following the 2019-20 bushfires. Survey results will be available in early 2025.

HOW DID WE DO IT?

We conducted semi-structured individual interviews (n=12) to assess their views on needs for, and value of, a Community Health and Wellbeing survey, and their suggestions of what it should include and how it should be implemented.

WHO WAS INVOLVED?

We worked with Fire to Flourish's four partner communities: Tenterfield, Clarence Valley and Eurobodalla in NSW; and East Gippsland in Victoria. Community representatives included teachers, community coordinators, health recovery facilitators, farmers, nurses, and CFA and NSW RFS workers.

WHAT HAVE WE LEARNED?

IN CO-DEVELOPING THIS SURVEY

- Co-designing the survey meant that communities felt heard and that their perspectives mattered.
- Communities reported being able to use the results from this survey to inform their overall health needs and services, and support them in advocating for themselves.
- It was critical to include health and mental health-related questions, along with questions related to healthcare service accessibility and availability.
- Aid distribution remains a difficult topic to talk about. However, it is important to understand how aid distribution helped and hindered the bushfire recovery of communities, particularly groups who might have been overlooked.

A MULTI-PRONGED APPROACH ENSURES REACH

There is no 'one size fits all' when conducting a community survey:

- Use of technology such as QR codes will support roll-out.
- Sending paper copies of survey to the addresses of people in the community is an important step.
- 'Survey days', where the team visits a community to conduct interviews, will be essential.

> "[The disaster] was quite traumatic but I think we forget that trauma [of] that magnitude is not going to go away within a year or two years. A long-term plan for support [is] needed."
> COMMUNITY MEMBER

LEARN MORE

Fire to Flourish is led by Monash University, with cornerstone investment from philanthropic partners, the Paul Ramsay Foundation and Metal Manufactures Pty Ltd. Additional philanthropic funding is provided by the Lowy Foundation.

MONASH University | MONASH SUSTAINABLE DEVELOPMENT INSTITUTE | paul ramsay FOUNDATION PARTNERSHIPS FOR POTENTIAL | ELECTRICAL MERCHANDISING | THE AUSTRALIAN CENTRE FOR SOCIAL INNOVATION

Mothers and babies in disasters. We can do better.

Elena Skoko,[1] Prof Yvette Miller,[1] Dr Jo Durham[1]

[1] Faculty of Health, School of Public Health and Social Work, Queensland University of Technology, QLD

Maternity Care in Disasters. New Frameworks for Immediate Action

What are the needs of childbearing women in disasters? Do current disaster management frameworks account for those needs? Can we do better with available knowledge and resources? This research aims to identify new opportunities to improve maternity care in disasters from a maternal perspective.

Introduction

Maternity care is a set of health interventions dedicated to preserving the life and wellbeing of childbearing women and newborns. In critical situations, such as disasters, neglecting specific needs of pregnant women and babies results in higher maternal and neonatal mortality and ill health that may have short, medium, long-term, and even inter-generational consequences.

Current facility-based model of maternity care, relying on social, economic and environmental stability, may not be adequate for disruptive events that have immediate impact on critical infrastructure. The resulting reduction, inaccessibility or interruptions to maternity care, often leave childbearing women on their own, especially in low resource settings.

Methodology

This research takes a critical realist approach to understanding the needs of childbearing women in disasters, with a maternal standpoint and grounded theory methods to identify new opportunities that could be implemented for improved maternity care in disasters, with particular attention to Queensland and Asia-Pacific Region.

Significance

The recent COVID-19 pandemic has challenged health systems worldwide, causing great concern among childbearing women and their representatives in all income settings, as maternal needs have assumed, minimised, or neglected. The present study addresses the issue of maternity care as a blind spot in disaster management policies and practice.

The study will offer a comprehensive overview of the current interventions and explore new options that account for the real-world needs and expectations of childbearing women, newborns and communities in disasters.

Disasters and climate change, which contributes to the growing number of unforeseen and sudden disasters, represent a growing concern for governments and societies globally. This research responds to the UN system's urgent call for a gender/women based approach in disaster research and management.

This PhD research project has been confirmed by QUT panel of experts and is currently undergoing ethical approval.

Further information

For additional information scan the QR code or contact:

Elena Skoko, PhD candidate, QUT

elena.skoko@hdr.qut.edu.au

Towards Resilient Urban Childhoods: Developing a Future-focused Framework

Primary Researcher (PhD Candidate): Yunjin 'Winty' Wang[1]
Research team (Supervisors): Prof Cheryl Desha,[2] Dr Kimberley Reis,[1] Dr Tanja Beer[3] , Dr Savindi Caldera[4], Dr Chamari Jayarathna [1]

[1] School of Engineering and Built Environment, Griffith University [2] Natural Hazards Research Australia
[3] Queensland College of Art, Griffith University, [4] School of Science, Technology and Engineering, University of Sunshine Coast

Developing a Future-Focused Framework for Designing Urban Green Space (UGSs) in High-Density Metropolitan Areas (HDMAs) in the Post-Pandemic Era

This research aims to create a framework for designing children's access to urban nature, collecting multiple parties' perspectives and integrating regional variables to ensure locally attuned outcomes.

Research Abstract

Urban green spaces (UGSs) are vital for children's mental and physical development. By 2050, 70% of the world's children are expected to live in high-density metropolitan areas (HDMAs) (Clark, 2020), limiting their access to UGSs (Brown et al., 2015) and contributing to 'nature-deficit disorder' (Roberts, 2009). Since late 2019, pandemic restrictions have further reduced children's access to green spaces (Engemann et al., 2019). Despite these challenges, children demonstrate a resilient desire to reconnect with nature (Rios et al., 2021), underscoring the need for regular UGS engagement in HDMAs. However, this issue often lacks attention from policymakers and service providers in urban planning (Dewi, 2012). Who is responsible for restoring children's access to HDMA-UGSs? Research over the past decade emphasizes the need for collaborative interventions among various social stakeholders to address this issue and enhance individual well-being (Tomasso et al., 2021).

Research question

How can UGSs contribute to improving children's physical and mental well-being in high-density metropolitan areas?

Sub research question 1 and findings:

- What roles do UGSs play for supporting children's well-being in HDMAs?
- Four key roles (themes) for HDMA-UGS were distilled from the literature.

Sub research question 2 and findings:

- How are UGSs influencing children living in HDMAs?
- The results showed that differences in UGS composition in the LGAs are linked to local policies. Compared to Beijing, Melbourne's LGA prioritizes green networks and fair distribution of UGSs.

Sub research question 3:

- How did children's attitudes and behaviours regarding UGSs change over the COVID-19 pandemic?
- Children from LGAs in Beijing and Melbourne both display four shifts in behaviours and attitudes towards HDMA-UGSs during the pandemic. Corresponding suggestions were proposed for each LGA.

Sub research question 4:

- What urban design strategies can improve the availability and quality of UGSs for children living in HDMAs?
- Four updated design strategies were put forward.

Synthesised design framework:

Preliminary findings reveal a conflict between children's needs for UGSs and the limited social resources in HDMAs. The approach aims to enhance UGSs' contributions to communities and cities by fostering connections with children and creating more sustainable and child-friendly urban environments. This strategy prioritizes children's well-being and promotes broader social, environmental, and economic benefits.

Fig 1: Proposed synthesized design framework

Significance

This framework will improve awareness among policymakers and service providers, regarding the importance of integrative planning and collaborative efforts in developing a comprehensive and inclusive design framework. The findings will enable decision-makers to enhance integrated HDMA-UGSs for children, towards improved physical and mental well-being.

Further information

For additional information scan the QR code or contact:
Yunjin WANG, landscape architect/researcher
yunjin.wang@griffithuni.edu.au

Resilience is disaster resilience and vice versa

Systemic disaster risk reduction for children and families

Dr Andrea Baldwin, Ms Sharleen Keleher, Dr Alex De Young, Dr Elisabeth Hoehn and Mr Neil Alcorn
Queensland Centre for Perinatal and Infant Mental Health, Children's Health Queensland Hospital and Health Service

'…traditional linear thinking about disaster management must be left in the past, as the changing risk landscape requires building resilience across social, economic, political, financial and ecological systems' (UN General Assembly, 2023, p. 5)

Systems support children's resilience

Resilience is not a stable intrapersonal quality. An individual child's response to a stressful situation is affected by:

- **Perceptions, ideas, attitudes, habits and skills** they bring to the situation (internal, shaped by their support systems)
- **Resources and supports** available to them (external, interactive)
- **Qualities of the situation** relative to internal and external resources they have available to respond (coping versus overwhelm)

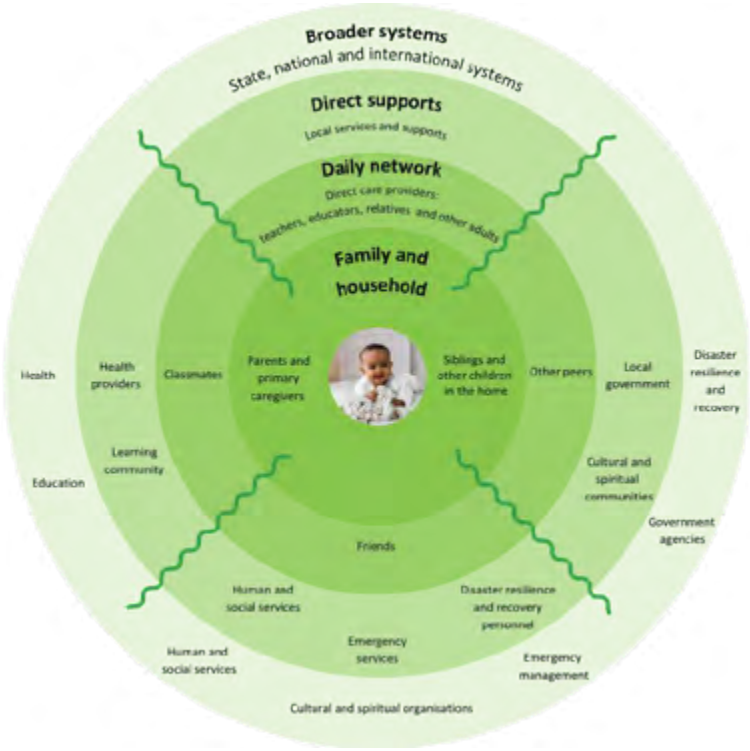
5 elements to promote resilience

- **Safety:** child feels physically, psychologically and culturally safe
- **Connection:** child feels connected with self, others, place
- **Calm:** child is supported to feel calm and regulate emotions
- **Agency:** child feels empowered to take meaningful actions
- **Hope:** child can focus on positives and trust in a hopeful future

(*after Hobfoll et al. 2007)*

Resilience ripples

- **Strengthening support systems** in preparedness helps support children in response and recovery
- **Strengthening children's resilience** in preparedness helps reduce demands on their support systems in response and recovery



Birdie's Tree practice examples

Northern Rivers NSW – Flood recovery

- Initial approach from national early learning provider network (**Broader systems**)
- Birdie's Tree Early Learning Program (BTELP) offered to early learning centres throughout Northern Rivers NSW (**Daily network**)
- Parents and caregivers (**Family and household**) saw displays, received communications and were invited to attend information sessions
- Professional development and consultations with Council staff, emergency services, human and social support organisations **(Local supports)**
- Children were supported to process their recent flood experiences and prepare for future events through early learning, home and community **(Child)**

Southern Moreton Bay Islands Queensland – Preparedness

- Council's Community Resilience and Recovery Officer arranged Birdie's Tree Universal Resources Training (BTURT) for community champions **(Local supports)**
- This engagement led to presentation on Birdie's Tree for Brisbane District Disaster Management Group – members took new knowledge back to their statewide organisations **(Broader systems)**
- Books and puppets were distributed to Council libraries and incorporated into First Five Forever and story-time programs **(Daily network)**
- Parents borrowed the books **(Family and household)** to read at home with children **(Child)**

Multiple resonating systems help children process their experiences of natural hazards and prepare for future events.

Birdie's Tree
Birdies-tree@health.qld.gov.au
Ph. 07 3266 0300

Queensland Government

Flipping the script

YOUNG PEOPLE MOBILISE ADULTS TO INCREASE PARTICIPATION IN DISASTER RISK REDUCTION

DR. TIMOTHY HEFFERNAN, UNSW SCHOOL OF BUILT ENVIRONMENT
MS KATHLEEN STEWART, SNOWY VALLEYS RESIDENT
PROF. CLIFFORD SHEARING, UNSW LAW AND JUSTICE
PROF. DAVID SANDERSON, UNSW SCHOOL OF BUILT ENVIRONMENT

INTRODUCTION

Adults are crucial for youth inclusion in disaster risk reduction, but adult's dual role as decision-makers and facilitators may overlook exclusion drivers. The Resilient Towns Initiative used a co-design method in the Snowy Valleys (NSW) to enhance youth participation.

Young people and adults working together at the final of three youth forums (Batlow 2023, T. Heffernan)

BACKGROUND

The Resilient Towns Initiative (RTI) worked with towns in the Snowy Valleys, NSW, after bushfires to aid community-centred recovery.

It was made up of:

- UNSW and RMIT researchers
- Local and state government
- Australian Red Cross, and
- Anglicare.

The focus was on engaging young people in disaster recovery through a co-designed workshop series.

METHOD

The co-design methodology involved workshopping young people's recovery ambitions at three forums in 2023.

Adults were initially excluded to address age barriers and enhance youth participation.

The final forum included adults and young people working together to advance disaster and community recovery efforts.

YOUTH FORUMS

The following principles were embraced at the forums:

- Cultivated a voice among young people, often where one did not exist beforehand.
- Generated ideas by embracing blue-sky thinking, playfulness and humour (there are no silly ideas).
- Identified values and a vision that summed up younger people's recovery ambitions.

At the final forum, young people were joined by adults to help progress and resource their ideas.

TO FIND OUT MORE ABOUT THIS PROJECT, VISIT:

t.heffernan@unsw.edu.au

HOW WE SURVIVE Reshaping disaster recovery · UNSW SYDNEY · RMIT UNIVERSITY · Australian Red Cross · Snowy Valleys Council · ANGLICARE · NSW GOVERNMENT

The day the rain stayed

Royal Far West
Children's health, country-wide

unicef AUSTRALIA
for every child

Before the floods

I used to play football with my friends and go fishing with my mum down at the river. It was green and peaceful there.

"All the water was brown"

When the floods came

Mum woke us up early and we left our home on a boat. All the water was brown. We had to stay in a hall with lots of people and I felt scared, cold and hungry. I couldn't bring my chicken, Nugget, and he died.

"It's good to share my story with everyone"

Things were different after

School was closed, we moved to a new house and my football games were cancelled. Our town looked different. I missed Nugget and my friends.

"Life is full of changes, bad things will get better"

In the future

I want the plants and animals to be healthy. I want to go back to my old school, see my friends, feel safe and enjoy the river again. I want the earth to be happy. Adults can look after the world by not overfishing and planting more trees.

A child born in 2020 in Australia will experience **four times as many heatwaves, three times as many droughts, and one and a half times as many bushfires** as those born in 1960.

Children see, feel and experience disasters differently and with their whole lives ahead of them, they have the most to lose. That's why we need to take their unique needs into account.

By listening to their voices – and their stories – we can build solutions that will keep them safe and minimise long-term impacts on their lives. Decision makers and authorities across the country should ensure disaster preparedness and response policies and practices are child sensitive.

UNICEF Australia and Royal Far West work together to understand the needs of children in emergencies here in Australia, and to ensure they are heard by decision makers.
Find out how you can put children's needs at the centre of your work too.

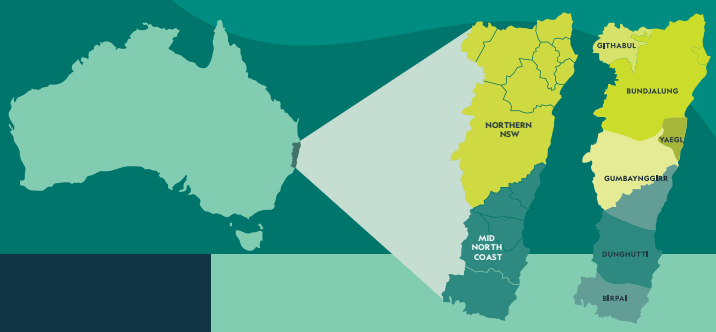
Royal Far West is dedicated to children's health in rural and remote communities. Our Community Recovery Services support children, families and schools in areas affected by natural disasters.

UNICEF Australia strives to make Australia the best place in the world to grow up. We work to ensure children have a say on decisions that impact them, and to put young lives at the heart of climate and emergency policies, actions and investments.

→ *This poster includes real quotes, narratives and drawings from children living in areas impacted by the 2022 floods in Northern NSW and Southeast Qld.*

Healthy North Coast
Resilient Kids Program

"Elevating youth voices and participation in disaster recovery program design."



Background

Following the 2022 catastrophic flooding in the Northern Rivers region, Healthy North Coast received a $10 million grant from the National Emergency Management Agency to design, deliver and evaluate the Resilient Kids Program.

The Resilient Kids Program focuses on prevention, supporting the mental health and social and emotional wellbeing of school-aged children affected by the 2022 floods.

Youth voices were the foundation for service design, combined with rigorous data, evidence, and best practice to inform decision-making. The resulting place-based program was designed to meet young peoples' needs in disaster recovery.

Resilience survey

Before designing the program, Healthy North Coast sought to understand the baseline needs of children and young people in the Northern Rivers. With more than 6,600 responses, the survey is the largest ever response to the Resilience Survey post-disaster and provided valuable insights.

6,611 children and young people from **75** schools completed the Resilience Survey

Survey outcomes

Indicators of resilience

- **90%** of primary students felt loved, supported and encouraged by their family
- Over **85%** of students believed it was important to help other people
- Over **75%** of students ate well to stay well
- Nearly **90%** of students reported always or often feeling safe at school

Points of concern

- **2 in 5** primary school students were at risk of developing trauma-related stress
- **40%** of secondary students were disengaged from learning
- **46%** of female secondary students showed high rates of anxiety symptoms
- **80%** of non-binary secondary students were 'surviving' or 'struggling'

Qualitative outcomes

STUDENT QUOTES

We asked students...

What is the one thing you would do to support the wellbeing of young people?

"Assure them of their safety, future, and freedom"
Grade 11 student

"Never give up believe in ur self (sic)"
Grade 7 student

"I would give all the people that lost there (sic) things in the flood fresh food and water and a place to live and give all the kids some new toys and all the parents and adults enough money to help repair"
Grade 4 student

Themes from the qualitative report

What students needed:

- Access to basic necessities
- Recreational fun activities and time in nature
- Social connections and support from those closest to them
- Consistent counselling support
- Teaching life skills and how to tackle 'big issues'
- A voice in decisions that impact their lives.

Student and community workshops

Workshops were held with students and Community partners to explore the findings from the Resilience Survey and identified focus areas to generate ideas on the needs and opportunities. The focus areas included:

- Counselling supports
- Life skills supports
- Community supports
- Relationship supports

The Resilient Kids service model

Drawing from the combination of information and insight, Healthy North Coast designed the Resilient Kids Program to reflect what was needed and asked for

Stream 1: Education and skill building

Disaster resilience education

Social and emotional wellbeing education:

- Improving emotional and mental health literacy
- Increasing help-seeking behaviours
- Improving older students' ability to support peers
- Tailored education for young people with disability

Parent and carer support

Stream 2: Community resilience building

Stream 3: First Nations Initiatives

Access to mental health services

Places to feel safe

Activities and things to do

Support with education

Capacity building for Aboriginal youth workers

Young people have an important role to play in disaster recovery. The influence of young people from the Northern Rivers was key to the development of the Resilience Kids Service model. The Program structure reflects what young people asked for and, because of this, will hopefully be more effective. An independent evaluation will test if goals were achieved as part of the program wrap up.

For more information, or to download this poster scan the QR code

Independent risk modelling to support community-led bushfire management

Andrew Sturgess[1], Bruce Teakle[2], Dominic Hyde[2], David Kington[2], Skye Doherty[2,3]

[1] FireSight, Brisbane, [2] Fire Futures, Mount Glorious & Mount Nebo, [3] The University of Queensland, Brisbane

Introduction

This project aims to empower the Queensland communities of Mt Glorious and Mt Nebo to better understand bushfire dynamics in their landscape so they can take action to mitigate risk and build resilience. Led by Fire Futures, a local bushfire action group, the communitiy associations commissioned expert, independent, bushfire modelling to understand fire behaviour under a range of environmental conditions. The results will inform a community-led bushfire strategy.

Method

The community associations funded bushfire behaviour consultancy FireSight to undertake an assessment of the likelihood and impacts of bushfires. Modelling involved extensive ground-truthing of local vegetation maps to ensure accurate fuel-load assessments and the gathering of historic weather data, to feed into more than 10,000 Phoenix fire simulations of ignitions across the surrounding country. Models of fires likely to threaten the community were tracked and their impacts were quantitatively assessed at high resolution.

Results

Fire impacts on the community were then modelled under these four scenarios (figure 2). Modelling showed that unsuppressed ignitions in drought-affected fuels could lead to severe fire impacts on the community in very elevated fire weather. Other scenarios resulted in fire impacts of considerably lesser severity. A ridge west of the Mt Glorious community was found to play a key role in approaching bushfires and offer valuable mitigation opportunities.

Figure 1: A planned hazared mitigation burn on private land at Mount Glorious. Since 2021 Fire Futures has been advocating for a more proactive, community-led approach to bushfire mitigation and resilience, one that responds to the local ecology and reduces the risk of extreme bushfire to both community and forest. Some residents have begun cool burns on their blocks with the help of the local rural fire brigade.

Conclusions

There are various assumptions among residents and agencies about evacuation, insurance, the responsiveness of agencies in the event of a fire, and the chances of a major fire or ember attack. Current messaging by agencies—complete evacuation under any fire scenario—fails to differentiate between the various risk profiles under differing fire conditions.

Although the communities are surrounded by national park with significant fuel loads, generally the landscape and dense forests result in moderate risk. This is now understood by the Fire Futures group, with the message spreading within the community. Understanding when the natural barriers to fire-spread are likely to fail is essential to guiding the community-led preparedness.

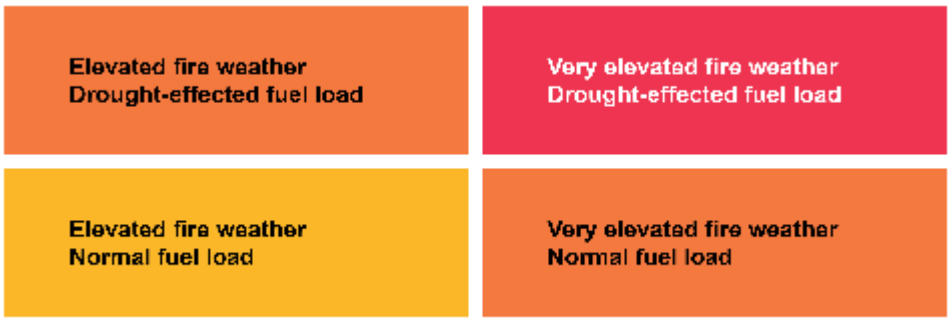


Figure 2: Forest-fuel load/flammability and fire weather conditions were modelled.

Acknowledgements

This work was undertaken on the lands of the Jinibara People. It was funded by the Mount Glorious Community Association and the Mount Nebo Residents' Association.

Modelling Pine Needle Surface Fires: A Comparative Analysis of up Slope Effects using a physics-based model

Natural Hazards Research Australia

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Modelling of Surface Fires

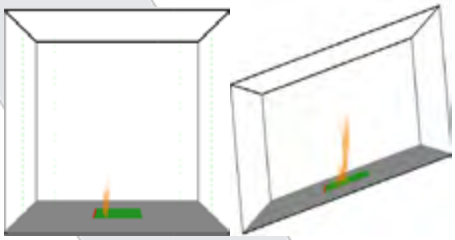
Surface fires are important in wildfire dynamics, burning vegetation near the ground and affecting fire growth. In certain situations, they can turn into crown fires, creating challenges for managing wildfires. This study investigates surface fires from pine needle fuel beds in a lab using Fire Dynamics Simulator (FDS) v6.8.0. Pine needle burning is worrisome in regions prone to wildfires and could result in transitioning to severe crown fires in pine plantations. Validation of FDS 6.8.0 is crucial for its use in wide range of complex scenarios due to its enhanced physics and chemistry compared to prior versions. This study conducted simulations on varying slopes (0°, 10°, and 20°) to explore how terrain inclination affects pine needle fire behavior. Comparison with Yang et al.[1]experimental results at 0° and 10° slopes revealed strong agreement. Additionally, we examined fire propagation under different slope angles (20°) to assess model accuracy across varied topographies.

Methods

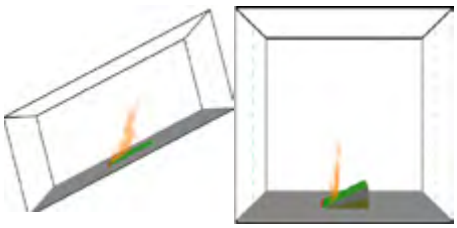
The present study validates a physics-based Computational Fluid Dynamics (CFD) wildfire model, focusing on surface fires. Its main aim is to improve understanding of surface fire spread across different slopes. In our study, we replicated the experimental setup [1]. The domain size was 6 m long (x = -2.25 to x = 3.75), 3 m wide (y = -1.5 to y = 1.5), and 2 m high. The boundary fuel model represented the vegetative fuel bed from x = 0 to x = 1.5 m and y = -0.5 to y = 0.5, consistent with the experiment. We maintained the fuel load at 1.2 kg/m² as in the experiment. Fig 1 shows the smoke view for each scenario. To simulate real-world conditions, we set the inlet, outlet, sides, and top boundaries as open, allowing for air inflow and outflow, consistent with the experiment. Furthermore, analysis of the data in Fig 2 shows that the fire front speed increases with an increase in the upslope angle, in line with findings reported in [2].

Results and Discussions

We determined the rate of fire spread (RoS) by extracting firefront locations, identified by a threshold surface temperature, along the central axis of the burnable pine plot at different time intervals from the boundary file using MATLAB. The RoS was quantified as the slope of firefront locations against time curve, providing insights into the dynamic fire spread behavior over time on varied slopes.



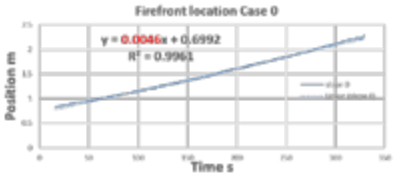
(a) (b)



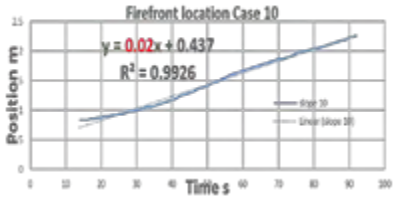
(c) (d)

Fig 1. The smoke view (a) case 0 (b) case 10 (c) case 20 (d) case 10 with step slope.

For case 0 , Fig 2 (a), (RoS) is 0.46 cm/s, close to Yang's study [1] which reported 0.507 cm/s. The relative error is 9.2%, indicating reasonable agreement between simulation and experiment. In Fig 2 (b), the simulation's RoS is 2 cm/s, notably higher than the experimental RoS of 0.7 cm/s for Case 10. This disparity indicates a lack of agreement between simulation and experimental outcomes for this case. In case 20 Fig 2 (c), the simulated RoS is 4.6 cm/s. However note that this specific case is not included in the experimental data. Using the step method instead of the gravity method in the simulation provides an alternative way to simulate the slope. We ran the simulation for up to 50 seconds, resulting in a Rate of Spread (RoS) of 0.53 cm/s, as depicted in Fig 2 (d), with a relative error of 0.25%.



(a)



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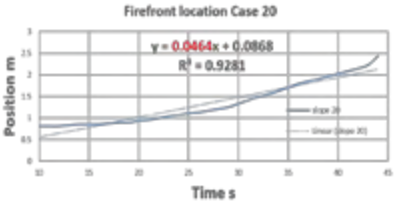

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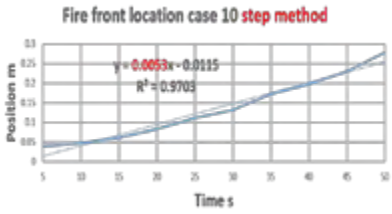

(d)

Fig 2. The fire front location vs time (a) case 0 (b) case 10 (c) case 20 (d) case 10 with step slope.

Conclusions

This study validates surface fire propagation on zero and upward slopes using FDS6.8. Key findings FDS6.8 simulation of zero-slope ROS has a 9.2% relative error compared to experimental data, and we are still working in slope 10 to get the lowest possible relative error.

References

[1] Z. Yang, H. Zhang, L. Zhang, and H. Chen, "Experimental Study on Downslope Fire Spread over a Pine Needle Fuel Bed," Fire Technology, vol. 54, no. 6, pp. 1487-1503, 2018, doi: 10.1007/s10694-018-0740-0.
[2]J. Cobian-Iñiguez, A. Aminfar, D. R. Weise, and M. Princevac, "On the use of semi-empirical flame models for spreading chaparral crown fire," Frontiers in Mechanical Engineering, vol. 5, p. 50, 2019.

Further information

For additional information scan the QR code or contact:

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Australian Government

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EVIDENCE, LEARNING AND HEALTH WITHIN AN EMERGENCY SERVICE AGENCY:

CFA Health Services

Georgia Thacker, Dr Chloe Begg and Nicole Taylor

Why evaluation?

In an increasingly budget constrained context, health programs must be targeted and effective, not just *'nice to haves'*. Integrated and robust program evaluation ensures that CFA continuously improves its health programs for its members.

Process

Developing a Program Logic

- Setting the objectives of CFA health promotions and the actions we plan to take to get there

Understanding Health Needs

- Health risk assessment: literature review
- Health needs assessment: CFA member survey

Strategy Development

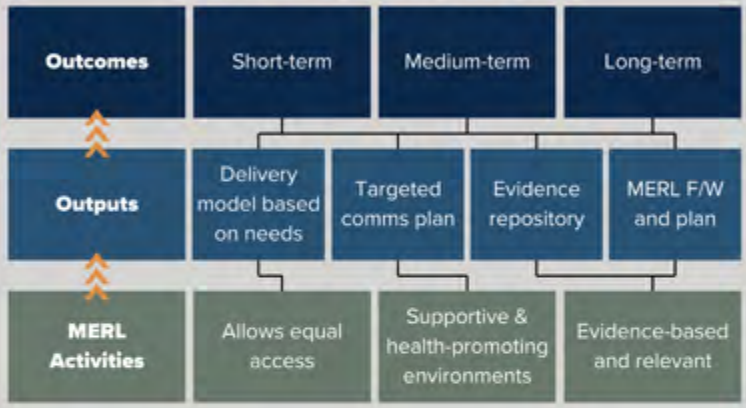
- Key action areas to address to improve health program content, promotion and delivery

Monitor and Evaluation

- Development of a monitoring, evaluation, reporting and learning (MERL) framework
- Identifying key activities to monitor and report on annually
- Defining data collection and storage requirements and systems

Program Logic

MERL Framework



Key Learnings

- **Dedicate internal resources instead of outsourcing evaluations for 'once-off' projects.**
- **Include ongoing evaluation into work plans / business as usual tasks.**
- **Ensure there is accountability to make changes to programs or services based on evaluation outcomes.**

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CFA's mental health literacy programs:

Changing the conversation through **storytelling**

CFA recognised the significant benefits of developing specialised mental health training tailored to the unique experiences of CFA members. Our aim is to build awareness and understanding of how we can collectively create a psychologically healthy and safe CFA. Every member should feel proud to be part of our mission where safety, wellbeing, inclusion, and values are front of mind.

This initiative aims to equip participants with the knowledge and skills necessary to recognise and manage psychological risks, increase awareness of available support, and encourage early help seeking.

Relatability & Authenticity

Connecting training content with people who represent their work in the emergency services makes the messages more relatable and authentic for participants. The individuals share the same challenges and experiences, creating a sense of shared understanding that's difficult to achieve through generic, external programs. This fosters a more meaningful and impactful learning environment for CFA members which strengthens participant engagement.

Trust & Credibility

The storytelling in customised training carries a high level of credibility. Their stories are grounded in the realities of everyday life but importantly also in the emergency services environment, making their advice and insights more trustworthy. Participants can feel confident in the information presented and adopt the recommended practices taught throughout the program.

Emotional Engagement

Studies show that even if a learner hasn't experienced the exact same situation, the higher possibility of experiencing a similar situation strengthens the relevance and impact of the story. If the situation is too far removed from the learners reality, the message loses relevance and impact. Storytelling engages the audience on an emotional level, making the information more memorable and impactful.

Modeling Behaviour

When leaders and fellow CFA members share their stories and experiences, they model behaviour for learners. It demonstrates the possibilities and opportunities to support psychological safety whilst maintaining professional responsibilities. This modeling can inspire others to take proactive steps for the psychological health & safety for themselves and others.

Memory Retention

Storytelling can enhance memory retention and enrich the learning experience by presenting information in a narrative format. This is supported by studies on adult and organisational learning. When people listen to stories they create mental images and emotional connections that help embed the learning. By embedding key messages within relatable and engaging narratives, participants are more likely to remember and apply what they've learned.

Values & Connection

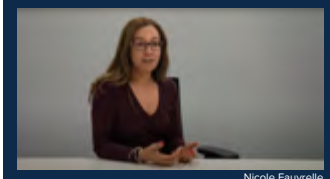
By reflecting appropriate values, experiences and realities, stories can strengthen organisational values. For CFA, incorporating stories from our own members reinforces identity and collective understanding. It can help bridge gaps between abstract concepts and real world applications, making the learning outcomes more relatable and more impactful. Storytelling underscores the importance of psychological safety across all CFA contexts, promoting inclusivity.

Trevor Owen
Deputy Chief Officer

"We're all human beings. We all have feelings, we all have emotions, we all have a level of mental health. But as leaders, we have responsibility to advocate, to promote, to take a genuine interest in our wellbeing and that of our people...Make the time to have those conversations and check in. 'What's going on in your life?' 'What do you find is stressful at the moment?' 'Are you going okay emotionally?' 'You attended a significant event last week. How's that resting on you?' "

Steph Beattie
Firefighter & Communications Officer

"One of the things that our brigade does that's actually helped me quite a lot in my mental health journey is check ins at our BMT meetings...I've been able to almost track my own progress through these check ins by seeing I was very much not ok, and admitting that, to yeah I'm actually really good; work's going well, life's going well."



Nicole Fauvrelle
General Manager - Health Safety & Wellbeing

"Everyone's different but there are so many things that we can look to in terms of protective factors... it's also making sure that we feel connected to the work that we do so that it's meaningful and valuable, and for I'd say the majority of us at CFA that's what's it's all about, it's that meaningful connection that gives us some purpose to what we do on a day to day basis. So understanding what those protective factors are for ourselves is a really important way of how we can maintain our mental health and wellbeing."

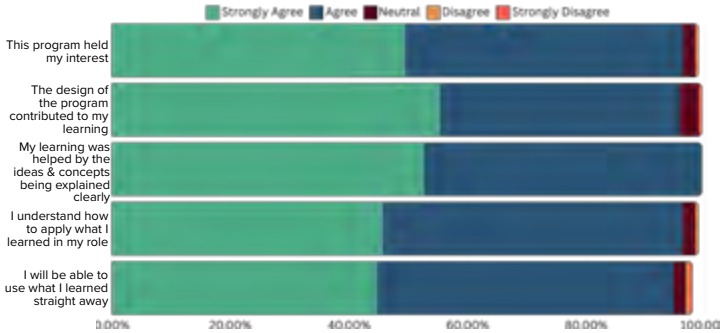
Andrew Perry
Firefighter & former Captain

"If you can be open with your feelings and open with your experiences other people will learn from you. You're gonna be a lot braver to talk. The Psychologist said to me you've done something brave and I said what's that? They said you've walked through that door. I turned up. What's the first thing you do to change the world as a volunteer? You turn up."

Phil Loukes
Captain

"Emergency services are unique. You get called and you don't know what you're responding to sometimes, so the exposure can be enormous. Having a safe psychological space is critical. The greatest asset we have is our people. Mentally, emotionally, psychologically, physically. We need to devote time to the care of our people. We need to foster a space where they can grow and flourish."

Participant Feedback



"I would like to send my thanks to the people who opened up their own stories in the videos. From someone who is currently struggling with health diagnoses, and is overdue in reaching out for help again, I feel this was the most important and most helpful part the course. Thank you."

"Program was well presented, and the personal stories shared by fellow CFA members added to my learning experience."

"Very much enjoyed seeing the representation of all CFA in the videos through various roles and people. I like that the realities of the risks we're exposed to in the emergency services both operationally and non-operationally are addressed. It's learning that all CFA members should complete."

"Loved it, loved the feel, loved the content, loved the simple messaging that can be immediately remembered and applied and I loved the authentic snippets of real stories and advice."

"Fantastic program. The personal experiences were particularly moving and impactful. Well done to them for being vulnerable so we can learn from their experiences. Excellent program that I will be encouraging all leaders to undertake. Thank you!"

"It was great seeing familiar faces in the videos. Felt like the training was really relevant to me. Thanks"

"The interviews were fantastic :)"

Program Content

Digital Learning Modules

- Mind Matters: Psychological Health & Safety at CFA
- Leading for Wellbeing

Face-to-face Workshops

MIND MATTERS: BUILDING RESILIENCE	CHECKING IN: WELLBEING CONVERSATIONS	LEADERS CHECKING IN: WELLBEING CONVERSATIONS
Discover resilience building strategies and self-awareness techniques. Acquire practical tools including breathing and grounding techniques. Learn positive psychology strategies including addressing mind traps, and building your 5 ways to wellbeing.	Understand the importance of mental health and wellbeing conversations at CFA. Learn how to prepare for and approach a supportive conversation using a 5-step guide.	Understand your responsibilities as a leader in supporting psychological health & safety. Learn how to recognise changes, check in with your team members and provide ongoing support using a 5-step guide.
NAVIGATING TRAUMA	**NAVIGATING GRIEF & LOSS**	**LEADING FOR WELLBEING**
Gain awareness of trauma and how it can impact individuals, teams and communities. Recognise the signs and symptoms of trauma and learn how to support recovery.	Learn about the impact of grief and loss, and recognise the signs and symptoms. Explore the concept of growing around grief and learn about available supports.	Learn about the importance of psychological health & safety at CFA and your responsibilities as a leader. Understand the benefits of leading with psychological safety front of mind, and learn practical strategies to support CFA members.

Safeguarding wellbeing:
Supporting allied health professionals involved in disaster recovery programs

Tracey Parnell[1], Michael Curtin[1], Donnah Anderson[1], Mehdi Rassafiani[1], Sarah Eagland[2], Jessica Shonk[2] and Tayla Iellamo[2]

1 - Charles Sturt University,
2 - Royal Far West

Background

The challenging and emotionally demanding nature of disaster recovery work can place allied health professionals (AHPs) at risk of vicarious trauma, post-traumatic stress disorder, burnout, and compassion fatigue. Due to this risk AHPs may benefit from regular psychosocial support aimed at mitigating negative impacts of this type of work.

Royal Far West (RFW) implemented the Team Wellbeing Project to monitor and support the wellbeing of allied health staff involved with the Community Recovery Services (CRS).

The CRS was implemented following the 2019-2020 Black Summer bushfires and delivered to preschools and primary schools across NSW.

The focus of the Project was to implement targeted solutions to maintain allied health professionals' wellbeing to ensure they could sustain working in disaster affected communities.

The Project reviewed the available evidence on current strengths and needs for staff's collective wellbeing.

Targeted solutions included:

Individual self-care plans
Online professional learning course on managing vicarious trauma
Development and use of case complexity tool to support safe caseload allocation
Post community visit group debriefing with external supervisor

Aim of the evaluation

To monitor the wellbeing of allied health staff involved in the CRS using the Professional Quality of Life Scale (ProQOL).

The ProQOL (Figure 1) is a measure of the positive and negative effects of working with people who have experienced extremely stressful events (Stamm, 2010, p. 12). It is not a diagnostic test. It is a tool used to provide information about the quality of life of the person providing care.

Figure 1 (from Stamm, B. H. (2010). *The Concise ProQOL Manual*. Pocatello, ID: ProQOL.org)

References

Stamm, B.H. (2010). *The Concise ProQOL Manual*, 2nd Ed. Pocatello, https://proqol.org/

Methods

All RFW allied health staff involved in the CRS between January 2022 to June 2023 were invited to complete the ProQOL at the end of four consecutive school terms and participate in an in-depth interview.

Findings

Over the four rounds of the ProQOL on average the allied health professionals rated themselves as having moderate compassion, moderate burnout and low secondary traumatic stress. (Figure 2).

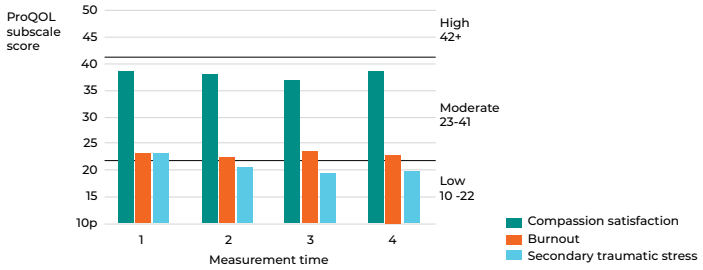


Figure 2: ProQOL mean scores for three rounds of data collection

According to the ProQOL documentation this outcome is a positive result as it "represents a person who receives positive reinforcement from their work and carries no significant concerns about being 'bogged down' or inability to be efficacious in their work. They do not suffer any noteworthy fears resulting from their work." (Stamm, 2010, p. 22).

The staff members interviewed were positive about the wellbeing support implemented by RFW and the promotion of a culture that prioritised staff wellbeing. They also reported employing a variety of personal strategies to maintain their wellbeing and emphasised the importance of being aware of signs indicating their need to implement wellbeing strategies.

RFW Staff Reflections

"I think that the wellbeing plans that we have in place for everybody are really helpful because it is an opportunity to plan and to think what is it that will support me. What is it that might trigger me. And to have those consistently in place, you are not just reacting when you do have something that has distressed you."

"I don't think anyone would bat an eyelid at saying, I am going to take two days to look after my mental health and we would be 100% behind that [...] look at prevention for the next time."

"It still affects you, but I think that knowing the signs within myself when it has impacted me and to reach out. I am more in tune with those signs now."

"From the top down it has been proactive and preventative [...] I don't feel like they are waiting for people to be exhausted [...] It is not an optional debrief [...] It's already booked [...] You don't have to say I'm feeling really stressed afterwards I need to speak to someone; it is already there."

Conclusion

A proactive and preventative approach is key to maintaining the wellbeing of staff involved in disaster recovery initiatives.

Each staff member had a personal wellbeing plan which included a range of personal and organisational strategies they implemented to maintain their wellbeing.

Staff stressed the importance of being self-aware of personal triggers and signs indicating they needed to seek support or implement a strategy from their wellbeing plan.

Staff were positive about the wellbeing support and strategies implemented by RFW and the leadership team, particularly promotion of a psychologically safe culture within the organisation that prioritises wellbeing.

Findings suggests that implementing a program to support team wellbeing and monitoring the professional quality of life through a tool such as the ProQOL, contributes to ensuring the emotional health and wellbeing and sustainability of allied health professionals involved in disaster recovery work.

Implementing proactive strategies to safeguard the wellbeing of AHPs involved in disaster recovery initiatives is paramount. The findings of this study suggest that AHPs benefit from regular monitoring and a range of supports to mitigate the negative impacts of disaster recovery work.

BeingWell
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HART PROGRAM

High Adversity Resilience Training

Background and History

Following the 2019/20 bushfires throughout NSW, there was an increased focus on first responders mental health and wellbeing.

A Joint Agency Initiative (JAI) was developed, with key agencies including Fire + Rescue NSW, NSW Rural Fire Service and NSW State Emergency Service (SES).

The need for resilience training was identified by the JAI. The **High Adversity Resilience Training** - **HART** program (by *Hello Driven*) was selected as the preferred supplier.

Internal wellbeing team members from the NSW SES were trained as HART instructors to roll out the program across the state.

How we tailored an off shelf program

Prior to commencing program, we conducted stakeholder engagement in order to understand the nature of high adversity roles within the NSW SES, and gauge the appetite for this program.

Zone based Incident Management Teams (IMTs) were selected as the first cohort due to the mental health impacts they experienced following 5 years of high tempo operational activity.

IMT roles have unique features of high adversity:

- High pressure
- Critical decision making
- Exposure to potentially traumatic material and events
- Delivering difficult news to the public

Co-designed the program delivery strategy with operational leadership within each IMT.

HART instructors spent time in each IMT location to better understand their needs and to build trust and strengthen relationships.

Supported people leaders to promote the program among their teams, resulting in high levels of course engagement and completion.

Held training sessions offsite and during that hours that suited the specific IMT cohort.

Continuous quality improvement throughout the program increased participant engagement.

Key Lessons

Building resilience skills in first responders

a. Need to **build resilience** among first responders to prepare them to meet not only operational, but also organisational and relational challenges.
b. Appreciate the **strengths of first responders**, rather than focusing on what is missing (**strengths based approach**)
c. Invest in **building psychological safety** among participant cohort to foster an **open and productive learning environment**

Tailoring an off shelf program to meet needs of diverse first responder agency

a. Ensure that the program is **tailored** to the unique needs of the NSW SES and its **diverse membership**
b. Work **alongside each cohort** to further ensure **individual needs** are **supported**
c. A **flexible approach to delivery, ensuring participants can focus on core operational activity responsibilities**

Embedding learning beyond classroom

a. Offer **individual** and **group coaching during and after the program**
b. HART instructors available to provide **real time support** during periods of operational activity
c. Support leadership to **embed resilience best practice** into ways of working and procedures

Emily May
Occupational Psychologist
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Enhancing Mental Health in NSW Department of Primary Industries and Regional Development Emergency Response Team

Department of Primary Industries and Regional Development

Steve Eastwood[1], Dave Gorman[1], Leigh J. Pilkington[1*]

The Issue

NSW DPIRD is the combat agency for biosecurity emergencies and food safety incidents and provides support for emergencies that affect agriculture and animals.

The higher frequency of responses means team members are spending more time working in high psychosocial risk environments and DPI must provide an environment which manages risks to wellbeing.

Previously there was no agreed approach to the management of psychological health and safety in emergency response.

To address risk a pilot was conducted in 2023 to embed mental health and wellbeing education and support before, during and after an emergency response.

What We Did

We tailored training for team members and IMT on how to prepare, maintain, and recover their mental health and wellbeing during and after an emergency response

A tool for individuals to plan and document their own wellbeing strategies and support network during an emergency response was developed

A guide for Safety Advisors to implement and monitor work health and safety systems, policies, and procedures during an emergency response is now available

Partnerships and agreements with various organisations to provide onsite social and formal support for response personnel, depending on the level and nature of the response were negotiated

Transition plans and exit screening tools for response staff to use after their involvement in a response are now in place

We have embedded mental health and wellbeing into the After-Action Review (AAR) and lessons management process for emergency responses

Outcome

- The pilot highlighted proactive and preventative measures and proved a great success with less incidents being reported and marked increases in interest in psychosocial wellbeing.
- An overall rating of very good to excellent
- 4.04 on a scale from 1 to 5 how likely participants would be to recommend the training to others
- An average of ‘very likely’ that participants will put the training into practice.
- An increase in participants' knowledge and awareness of mental health issues, as well as their confidence in supporting themselves and their peers during emergencies.

“It is great to see mental health... as a priority during response.”

“I think it will serve well as a guide for IMT leads to share relevant safety information to response personnel.”

“I’ve already applied some of the plan and it’s really useful.”

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Western Queensland Hospital and Health Disaster Management Network

Forging resilience

Networked Governance in health disaster management unites stakeholders from various sectors to prepare for, respond to, and recover from health disasters. It emphasizes partnerships, alliances, and networks. Key elements include collaboration among healthcare, emergency services, government agencies, non-profits, and community groups; leveraging resources through partnerships; exchanging data for better decision-making; flexible strategies; community involvement; and collective risk management. This model leverages combined resources and expertise for effective disaster management.

The Networked Governance Model

Core principles include collaboration, partnerships, and strategic alliances, focusing on flexible, adaptive responses to challenges in rural and remote settings. Workshops feature dynamic discussions, interactive sessions, and knowledge exchange.

Benefits

Enhanced resilience is achieved through combined resources and rapid disaster responses. Improved coordination and adaptive responses are realized through streamlined communication and continuous learning. In rural settings, benefits include resource optimization, expanded telehealth, comprehensive emergency plans, joint training, community engagement, integrated care models, digital health solutions, unified policy advocacy, and patient-centred care plans.

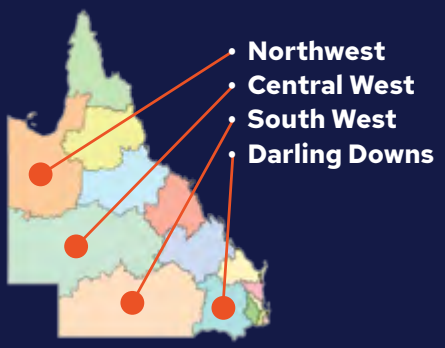
Future Directions

Biannual workshops will be held for continuous improvement. Hosting responsibilities will rotate among the participating HHS regions. These workshops will consist of collaborative multi-agency exercises, learnings from activations and incidents, resource sharing, and understanding of each other's business functions. A steering committee will be established by December 2024 to oversee the coordination and planning of these workshops. Ongoing collaboration aims to develop long-term partnerships to evaluate progress and address emerging issues.

Proactive engagement will be encouraged through monthly newsletters, beginning September 2024, highlighting best practices and success stories from various stakeholders.

The Western Queensland HHS Disaster Management Workshop demonstrated Networked Governance's efficacy in fostering collaboration among stakeholders, equipping Western Queensland to tackle disaster management challenges and build resilience.

Western Queensland HHS Disaster Management Network



Multi-Agency collaborations are implemented within the Queensland Disaster Management Arrangement (QDMA) framework with representatives from healthcare, emergency services, government agencies, and non-profits. Healthcare providers enhanced preparedness and response through collaboration involve sharing resources like bed capacity, medical supplies, and staffing. Collaboration strengthens relationships between healthcare providers, emergency services, government agencies, and community organizations. Participating stakeholders include South West, Central West, Darling Downs, and North West HHS, Queensland Police Service (QPS), Queensland Fire and Emergency Services (QFES), Department of Health (DoH) Disaster Management Branch and Digital Continuity, and Local and District Disaster Management Groups.

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Central West Health · Darling Downs Health · South West Hospital and Health Service · North West Hospital and Health Service · Queensland Government

iFire: AI Immersive Visualisation to Enhance Fire Training Sensemaking

Carlos Tirado Cortes; Dennis Del Favero; Greg Penney; Richard J. Hurley; Yang Song; Frank Wu; Michael J. Ostwald

Introduction

The frequency of extreme wildfire events has increased in the past few years, causing large-scale damage. Increasing our understanding of the factors contributing to wildfire scale and magnitude is critical, especially for the fire response personnel. Pre-exposure to the dynamism of wildfire behaviour, or *immersive sensemaking*, is necessary to gain enough situational awareness to handle the risks of confronting them, leading to improved decision-making under high-risk, high-pressure conditions. We present the *iFire* Project, a full-body, AI-powered, immersive geo-visualisation system to improve firefighter understanding. The different modules of *iFire* combine to provide an augmented comprehension of wildfires.

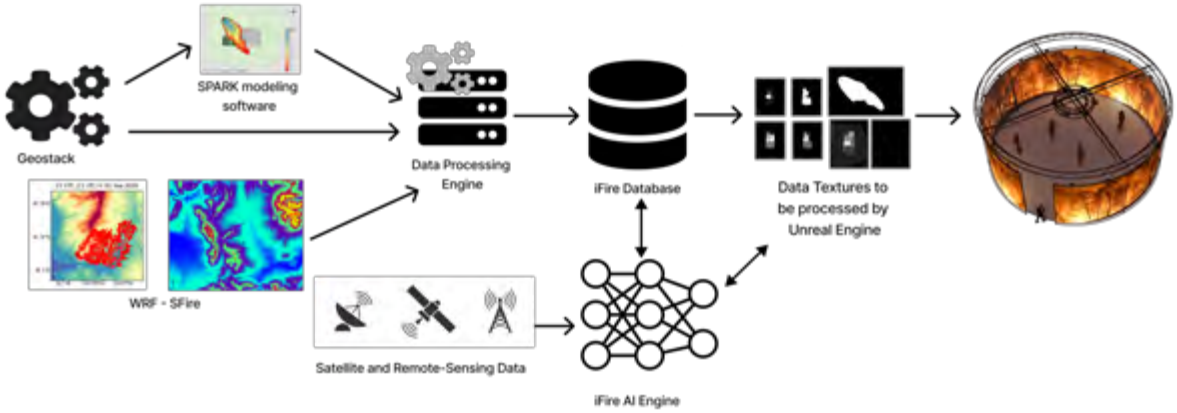

Figure 1: *iFire* System Overview and Data Flow

System Overview

Our system focuses on allowing end-users to situate themselves inside a wildfire event and interact with it through multiple immersive formats enhanced with different interactive techniques. Our datasets, in combination with numerous Machine Learning methods, provide a coherent scenario behaviour, exposing the users to the realistic behaviour of a wildfire. Our system visualises data from a hypothetical pine plantation in South Australia to showcase the capacity to process and display wildfire data from multiple fire modelling sources.

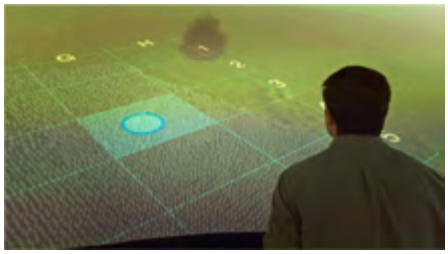

Figure 2. *iFire's* interaction allows full immersion.

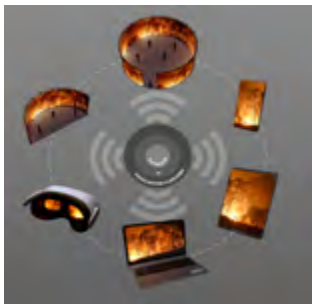

Figure 3. *iFire* networked system.

Discussion and Conclusion

The proposed system is the first step towards a high-fidelity representation of wildfire for sensemaking. Currently, the system is capable of immersively representing wildfires modelled by the SPARK and WRF-Sfire modelling systems. The hardware capabilities of *iFire* allow the system to situate users in a wildfire event. While the visualisation engine of *iFire* allows users to viscerally experience a realistic representation of the progress of a wildfire and its interaction with the environment. The interactive techniques of the system allow for the modification of the environment and counter the system's realism with different abstractions to enhance understanding. These features all combine to enhance the situational awareness of its users to provide a unique learning experience.

National Framework for Swiftwater & Floodwater

{{{ RESPONSE }}}

What You May Not Know?

- 167 Fatalities
- 300 Water Disasters
- 49% of all Disasters in Australia are Swift/Floodwater
- 18.1 Million People Affected in 2022 Alone
- 36 Disasters Declared in 2022

What If You Knew

Not all agencies train the same. Training ranges from 3 days to 10 days. WHY?

PUASAR002 "In Water Rescue" was not originally designed for Emergency Responders.
It was for Kayakers and Rafters.

There is no National Standard for Swiftwater/Floodwater Rescue.
Each State operates within its own silo.

Moving Forward

WE MUST

Be Honest

Be realistic in the appraisal of our agency's capability and our people's competency.

Are we as good as we think we are?

Recognise

That knowledge and skillset are not of equal level across agencies and that disparity in training exists.

Will your skills save a life or lose a life?

Acknowledge

The risk placed on our rescuers and that some individuals are not suited to the challenges of SFR.

Do you really understand the consequences?

Be Willing

To accept that the status quo is unacceptable, listen to our SME's and commit to change.

Are you up for the challenge?

Aim

- National standardised framework
- Risk-based criteria for training and competency
- Capability categorisation
- Reduce disparity among agencies
- Collaborative approach
- Meet community expectations
- Increased safety for rescuers
- Driven by Operational SME's

Goal

- Contextualise the competency specifically for emergency response to floodwater and swiftwater incidents
- Optimise deployment of surge capabilities by elevating standards of proficiency
- Training and capability auditing process
- AFAC accredited agencies and capability ranking

Quality with Quantity → United Approach → Enhanced Training & Capability

Respect Integrity Courage Loyalty Trust

For the National Framework Report Please Scan the QR code

Queensland Government

ENHANCING FLOOD RESCUE IN NSW

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3
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Understanding our current and future risk

An enhanced understanding of flood risk through analysis of a range of data sets on flooding, population and historical workload. This has enabled greater visibility of gaps in capability, which has informed investment in vessels, vehicles and equipment, and prioritisation of accreditation targets, training and support staff deployments.

Upgraded systems

Enhanced systems to better coordinate flood rescue operations and increase interoperability with partner agencies. These systems enable flood rescue coordinators to task and respond resources more quickly, and triage and prioritise flood rescue incidents during complex operations.

Modernised policies and doctrine

Updates to policies to reflect a modern approach to flood rescue in NSW with the NSW SES as the combat agency for flood, and the leading agency for flood rescue. This includes the introduction of new triage and prioritisation categories to ensure efficient and effective use of flood rescue response resources.

Recruiting and training flood rescue operators

Hundreds of new flood rescue operators are part of units across NSW following investment in volunteer recruitment and training. This additional capacity supports communities across NSW as part of a 24/7 flood rescue capability.

Upgraded facilities

Upgrades to flood rescue cells, including technology and infrastructure, has enabled flood rescue coordinators to undertake their role more effectively. These regionally located facilities play a critical role in the coordination of flood rescue incidents.

New vehicles and equipment

A range of new vehicles, vessels and specialist flood rescue equipment has been allocated to Units across NSW, particularly in areas at risk of flooding. These new assets enable volunteers to respond with enhanced capability and operate more safely when attending flood rescue incidents.

Enhanced coordination capability

When a Flood Rescue Area of Operations (FRAO) is declared, the NSW SES is in control of all flood rescue response assets from all agencies. With new training, systems, facilities and equipment, the NSW SES is better placed as the combat agency for floods to coordinate flood rescue incidents.

Find out more about Flood Rescue

NSW STATE EMERGENCY SERVICE

ses.nsw.gov.au 132 500

@nswses

facebook.com/NSW.SES

Enhancing rural emergency response: The Sandpiper Mass Casualty Bag

After a gas leak at the St George State School on February 21 2023, a project was undertaken to the ability of the South West Hospital and Health Service to respond to emergency situations through replacement of emergency kits with the Sandpiper Mass Casualty Bag.

The Sandpiper Trust Established in 2001 by the Dickson family in Scotland after 14-year-old Sandy Dickson's death due to delayed emergency response, the Sandpiper Trust's mission is to ensure timely emergency aid for rural communities. Named after the Sandpiper bird, it symbolizes resilience and light-heartedness, reflecting Sandy's spirit.

Impact on rural healthcare

The South West Hospital and Health Service's (SWHHS) adoption of the Sandpiper Bag demonstrates a commitment to improving emergency response in rural and remote areas. Enhanced response capabilities lead to better patient care and increased community resilience, supporting comprehensive incident response and management in rural and remote healthcare settings.

Features

The bag ensures quick access to medical supplies during mass casualty incidents with a modular layout for efficient triage and treatment. It includes customizable compartments, integrated oxygen delivery systems, and is lightweight and ergonomic tailored for remote environments, challenging terrain and diverse conditions. It supports interventions like chest decompression, surgical airways, and advanced analgesia, providing essential tools for onsite medical staff.

Comprehensive training, led by Dr. Adam Coltzau, ensures effective use of the Sandpiper Mass Casualty Bag.

Benefits

Compared to traditional Thomas packs, the Sandpiper Bag offers quicker access to supplies, better organization through its modular design, enhanced features for rural needs, and is lightweight and ergonomic for difficult terrains.

SWHHS's adoption of the Sandpiper Bag improves emergency response in rural areas, leading to better patient care, increased community resilience, and improved incident management.

Pre-Hospital Deployment Course

- Deployment Principles (45 mins): roles, scene safety, and liaison with emergency services.
- Sandpiper Bag Familiarisation (45 mins): detailed review of the bag's contents and usage, including cold drugs and controlled substances.
- Desk Top Scenarios (1 hr): simulations like motor vehicle and farm accidents.
- Practical Skills (45 mins): hands-on training for IV access, airway management, and other procedures.
- SiM/Scenario Training (45 mins): team-based scenarios in diverse environments.
- Evaluation and Close (10 mins): skills assessment and course feedback.

Dr. Adam Coltzau, Director of Medical Services, St George Hospital is the SWHHS Clinical Lead for this project and provides expert training on using the Sandpiper Bag effectively.

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Acknowledgements

We thank Sandpiper Trust Australia for their support in enhancing rural emergency response. Special thanks to Dr. Tim Leeuwenburg, Chair of Sandpiper Australia, for his leadership in implementing the Sandpiper Mass Casualty Bag and advancing rural pre-hospital healthcare.

Volunteer Assignment and Transportation Planning for Aged Care Centre Evacuations during Natural Disasters: Mathematical Modelling

Seyed Mohammad Khalili*; Moe Mojtahedi*; Christine Steinmetz*; David Sanderson*
*School of Built Environment, UNSW, Sydney, NSW, Australia

Abstract

Every year, parts of the world, including Australia, face natural hazards like floods and bushfires, necessitating evacuations. This is particularly challenging for the elderly in aged care centres, who require assistance and have limited access to transportation. Staff shortages during disasters further complicate evacuations, but volunteers play a crucial role if effectively organised. This research addresses volunteer assignment and transportation during the evacuation of aged care centres. It develops a novel mathematical model to minimise total evacuation costs, considering uncertainties in volunteer availability, travel times, and transportation network accessibility. The model incorporates pre-establishment agreement costs, travel costs, and suitability costs related to volunteer skills. A robust optimisation approach is used to manage these uncertainties. The model's applicability is demonstrated for Lismore, NSW, in hypothetical flood scenarios, showing its potential to improve evacuation efficiency for vulnerable populations.

Figure 1. Evacuation planning of vulnerable people during floods.

Introduction

Disasters are conventionally overseen through four phases: prevention, preparedness, response, and recovery. Disaster preparedness and response operations involve planning evacuation routes and establishing relief shelter locations to protect individuals from disaster impacts. Evacuation refers to the process of individuals leaving their homes to seek safety during disasters (Mojtahedi and Oo, 2017). Vulnerable individuals, as defined by Wolshon et al. (2005), include groups such as the elderly, infirm, impoverished, homeless, orphaned, incarcerated, indigenous, and tourists. Personal transportation, efficient under normal conditions, poses significant challenges for emergency management authorities dealing with vulnerable populations due to their lack of car access, as illustrated in **Figure 1**. Local governments often face deficiencies in transportation resources and planning for evacuating vulnerable individuals during disasters (Freire and Stren, 2001).

The study focuses on volunteer assignment and transportation decisions during the evacuation of aged care centres. A novel mathematical model is developed to minimise total evacuation costs, considering uncertainties in volunteer availability, travel times, and transportation network accessibility. The model includes pre-establishment agreement costs, travel costs, and suitability costs related to volunteer skills. The model's applicability is studied for Lismore, NSW, in flood scenarios. This approach ensures a comprehensive evacuation strategy, accommodating the complexities and uncertainties inherent in disaster situations.

Conceptual framework

A research conceptual framework for this study is proposed in **Figure 2**, drawn primarily from the literature. As shown, the study begins with the disaster management theme, focusing on emergency humanitarian logistics and specifically on evacuation operations in post-disaster logistics planning. The main contribution lies in developing decision-making models using operations research for post-disaster evacuation planning. Mathematical modelling and optimisation methods for evacuation have received less attention compared to other approaches, particularly in supported or transit-based evacuation planning. This research addresses this gap by developing a novel mathematical model for the evacuation of aged care centres, optimising volunteer assignment and transportation decisions to minimise total evacuation costs while considering uncertainties in volunteer availability, travel times, and transportation network accessibility.

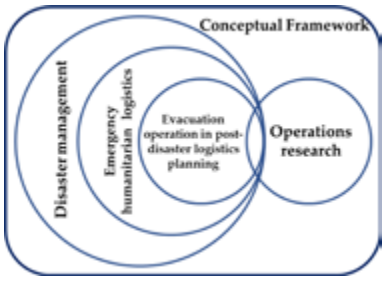

Figure 2. Conceptual framework of the study.

Problem description

This study proposes a novel two-stage scenario-based mixed-integer stochastic programming mathematical model for optimising evacuation operations of aged care centres. It is a type of transit-based evacuation planning problem that focuses on transporting vulnerable individuals, who have limited access to private cars, from affected areas to safe shelters within strict time constraints. These plans can be formulated through mathematical modelling approaches, sharing similarities with vehicle routing problems. In the first stage, the model determines the optimal assignment of evacuation centres to receiving aged care centres (y_{jr}) and the allocation of volunteers to evacuation centres (z_{jk}). In the second stage, it optimises the detailed evacuation plan under various disaster scenarios (x_{ijrk}). These scenarios encompass different predicted disaster impacts on the transportation network and their likelihoods, involving factors such as road closures, rendering some parts of the network inaccessible and significantly impacting travel times.

Figure 3 illustrates the considered problem in a sample transportation network, where volunteers are dispatched from their locations to evacuate vulnerable individuals from aged care centres and transport them to receiving centres through the safest and fastest routes. This model's applicability is demonstrated for Lismore, NSW, in hypothetical flood scenarios, showcasing its potential to enhance evacuation efficiency for vulnerable populations.

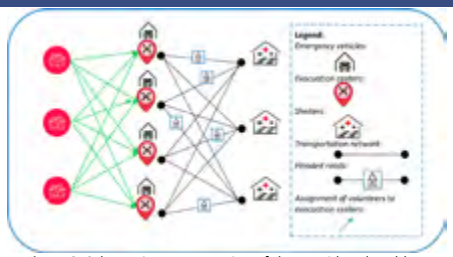

Figure 3. Schematic representation of the considered problem.

Mathematical modeling

The integrated transit-based evacuation planning and volunteer assignment problem in this study is formulated based on the main assumption like (Goerigk et al., 2013) and (Fazel-Zarandi et al., 2013) with minor modifications.

- **Objective Function:** Minimise the total cost, which includes the pre-establishment agreement costs between evacuation and receiving centres, the travel costs of evacuees to evacuation centres, and the suitability costs of volunteers assisting senior evacuees:

$$\sum_{j\in J}\sum_{r\in R} f_{jr}y_{jr} + u\sum_{j\in J}\sum_{k\in K} z_{jk} + \sum_{i\in I}\sum_{j\in J}\sum_{r\in R}\sum_{k\in K} c_{ijr}x_{ijrk}$$

- **Constraints:**

Evacuee Assignment Constraint: Each senior evacuee must be served by exactly one volunteer at one evacuation center and evacuated to one receiving center:

$$\sum_{j\in J}\sum_{r\in R}\sum_{k\in K} x_{ijrk} = 1, \quad \forall i \in I$$

Receiving Centre Capacity Constraint: The total number of evacuees received by a receiving center must not exceed its capacity.

$$\sum_{j\in J}\sum_{k\in K}\sum_{i\in I} x_{ijrk} \le b_r, \quad \forall r \in R$$

Evacuee-Receiving Centre Assignment Constraint: Each senior evacuee supported by any volunteer can be sent to a receiving aged care center if a pre-agreement is made between the evacuating aged care center and the receiving aged care center.

$$\sum_{k\in K} x_{ijrk} \le y_{jr}, \quad \forall i \in I, \forall j \in J, \forall r \in R$$

Evacuee-Volunteer Assignment Constraint: A senior evacuee cannot be served by a volunteer who is not assigned to an evacuation center.

$$x_{ijrk} \le z_{jk}, \quad \forall i \in I, \forall j \in J, \forall r \in R, \forall k \in K$$

Sequential Volunteer Assignment Constraint: Volunteers are assigned sequentially to an evacuation center.

$$z_{jk} \le z_{j(k-1)}, \quad \forall j \in J, \forall k \in K \setminus \{1\}$$

Evacuation Time Window Constraint: Introduce a new variable $\emptyset_{sj}$ to represent the maximum evacuation time:

$$\phi_{sj} \ge \max_{i,r,k}\{t^s_{ir}x_{ijrk}\}, \quad \forall s \in S, \forall j \in J$$

Ensure that the expected value of the new variable is less than or equal to the evacuation time window $Q(j)$:

$$E(\phi_{sj}) = \sum_{s\in S} p_s\phi_{sj} \le Q(j), \quad \forall j \in J$$

Binary Decision Variables:

$$y_{jr}, z_{jk}, x_{ijrk} \in \{0,1\}, \quad \forall i \in I, \forall j \in J, \forall r \in R, \forall k \in K$$

Discussion and conclusion

The proposed two-stage stochastic programming minimises total evacuation costs by assigning centres and allocating volunteers, considering uncertainties like road closures. This study employs a two-level logic-based Benders' decomposition approach for efficient solution. Demonstrated in hypothetical flood scenarios in Lismore, NSW, it shows potential to improve evacuation efficiency and effectiveness for vulnerable populations.

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References

1. Mojtahedi, M.; Oo, B. L., The impact of stakeholder attributes on performance of disaster recovery projects: The case of transport infrastructure. International Journal of Project Management 2017, 35 (5), 841-852.
2. Wolshon, B.; Urbina, E.; Wilmot, C.; Levitan, M., Review of policies and practices for hurricane evacuation. I: Transportation planning, preparedness, and response. Natural hazards review 2005, 6 (3), 129-142.
3. Freire, M.; Stren, R. E., The challenge of urban government: policies and practices. World Bank Publications: 2001.
4. Goerigk, M., Grün, B., & Heßler, P. (2013). Branch and bound algorithms for the bus evacuation problem. Computers & Operations Research, 40(12), 3010-3020.
5. Fazel-Zarandi, M. M., Berman, O., & Beck, J. C. (2013). Solving a stochastic facility location/fleet management problem with logic-based Benders' decomposition. IIE Transactions, 45(8), 896-911.

Strengthening Response Capacity: Building NSW Department of Primary Industries and Regional Development's Emergency Response Team

Department of Primary Industries and Regional Development

Jackie Barker[1], Aaron McGifford[1], Dave Gorman[1], Leigh J. Pilkington[1*]

Phase 1 – Discovery

The project used human-centred design to determine the path forward at commencement

- Built upon previous research including an empathetic report that unpacked the reasons that people choose (or not) to work in emergency responses
- Considered reviews into emergency response systems and software
- Conducted staff surveys and stakeholder interviews
- Included sentiment analysis

"How we might change the way that people think and feel about participating in Emergencies, so they feel rewarded and supported, and that leads us to having more participants than we need?"

Phase 2 - Two-Stream Design

Stream 1 - Orientation

Effective members of the Emergency Response Team need an orientation into emergency responses that practically prepares participants, so that they feel confident and supported to efficiently deliver their response role, and comfortable to return to future responses.

Designed an orientation process to familiarise participants with working in responses:

Structures (AIIMS)
Systems (WebEOC)
Process (emergency management doctrine)
Wellbeing

Stream 2 - Readiness Conversation

Effective members of the Emergency Response Team will participate in a Readiness Conversation that facilitates self-reflection of their skills and experience, and provides feedback from experienced emergency response team members to determine if they are ready to step up and undertake Incident Management Team roles.

Phase 3 - Delivery

We registered interest from over 200 participants, conducted face to face and online inductions with over 200 participants, and assigned roles to over 200 participants.

We have commenced capability assessments on over 200 participants against roles and prepared over 150 individual learning plans for participants.

Outcome

A more engaged workforce, including more than 450 active emergency responders.

Communities of practice have been established for each AIIMS function, a quarterly emergency management newsletter has been created and targeted professional development activities have been scheduled for each quarter.

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Sustainable and Resilient Road Design Principles in Southeast Asia

3 PRINCIPLES OF SUSTAINABLE AND RESILIENT DESIGN

Through Partnerships for Infrastructure (P4I), Australia is partnering with Southeast Asia to respond to challenges in maintaining growth momentum, tackling poverty and responding to climate change.

Disaster Risk Reduction and Climate Change

P4I works with partners to realise the economic benefits of integrating disaster and climate resilience into infrastructure projects.

What?

Sustainable and resilient road design principles aim to minimise environmental impact, ensure public safety and at the same time, promote economic growth.

They include using recycled materials, incorporating green infrastructure, and designing for multiple modes of transportation.

How?

Integrate nature-based solutions into planning, design and delivery of infrastructure.

Ensure road design considers future projected extreme weather events and the lifespan of the asset.

Replace materials with locally sourced, sustainable alternatives such as recycled asphalt.

Why?

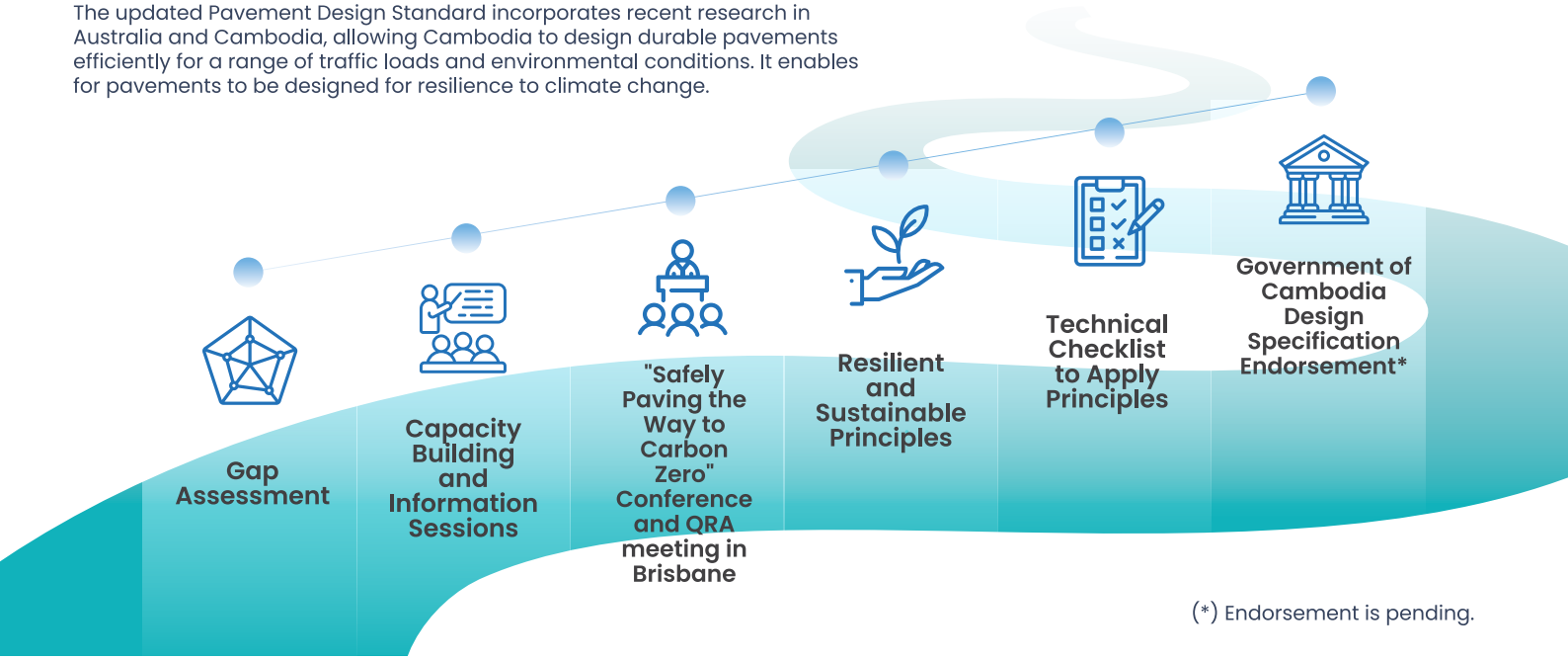
Southeast Asia is particularly vulnerable to the adverse impacts of climate change.

Resilient road design is crucial to ensure that roads remain operational and safe during extreme weather events, thus minimising disruptions to lives and livelihood.

Sustainable practices can also attract financing from institutions that prioritise climate-resilient projects.

Updating Cambodia Ministry of Public Works and Transport's Bridge and Road Technical Standards, with Austroads

The updated Pavement Design Standard incorporates recent research in Australia and Cambodia, allowing Cambodia to design durable pavements efficiently for a range of traffic loads and environmental conditions. It enables for pavements to be designed for resilience to climate change.



(*) Endorsement is pending.

A POLICY REVIEW: THE POTENTIAL FOR HARMONISATION OF THE AUSTRALIAN EMERGENCY MANAGEMENT ARRANGEMENTS

The Commonwealth of Australia was proclaimed January 1901 under a federal system of government. With the Australian Constitution identifying the preservation of existing Constitutions across the six original colonies the responsibility for the protection of their citizens was retained within each State through their independent legislative powers. A number of emergency events since Federation have challenged this siloed approach.

Issues identified:

- Despite countless significant emergencies and reviews into these events identifying recommendations for improvement Australia remains with disparate emergency management arrangements, with no two jurisdictions capable of reflexive integration of resources.
- Whilst there have been some changes individual legislation remains extant with each jurisdiction operating within different emergency management environments, with a limited national coordination approach*.

The table below provides examples of hazard events with reviews and identified outcomes.

HAZARD EVENT AND IMPACTS	WAS THERE A REVIEW?	WERE THERE ANY OUTCOMES OF THE REVIEW? SOME EXAMPLES
Cyclone Tracy, NT, 1974; widespread damage; 71 fatalities; $200million insurance costs.	'The Commonwealth response to Cyclone Tracy: implications for future disasters' (McNamara, 2012).	Whilst not a formal review, topical arguments were raised of the constitutional authority for Commonwealth management of a jurisdictions' responsibility to protect its' population under independent legislation. In this particular event there has been argument that there was indeed such authority to do so, but whether this would be consistant with contemporary legislation remains questionable.
Ash Wednesday Bushfires, VIC and SA, 1983; widespread damage; 75 fatalities; $176million insurance costs.	'Report of The Bushfire Review Committee on Bushfire Disaster Preparedness and Response in Victoria, Australia, Following the Ash Wednesday Fires of 16 February, 1983' (Miller, Carter, and Stephens, 1984).	Recommendations made through this review were inclusive of the establishment of an enhanced coordination mechanism, of a broader role of local government within counter-disaster planning, fire prevention, and local preparedness, of improved communications, and national considerations such as compatibility with state-based emergency systems. Whether the implementation of any of these recommendations were of a measurable effect for the events of the Black Saturday bushfires in 2009 is debatable.
Townsville Floods, QLD, 1998; widespread damage; 1 fatality; $71million insurance costs.	'Townsville flood hazard assessment study. Phase 3 Report Vulnerability Assessment and Risk Analysis. Townsville City Council, December 2005' (Maunsell Australia, 2005).	Whilst not a formal review, the localised assessment of risks presented by the hazard of flooding, the exposure of the community to such events, community vulnerability in the event of a flood occurring, and the likely impacts of such were actioned by consultants through LG sponsorship. Whilst improvements were identified, they did not appear to prevent the impacts from subsequent flooding event in 2019.
Heatwaves, VIC and SA, 2009; widespread impacts; 374 fatalities; $unidentified insurance costs.	'The unfolding story of heat waves in metropolitan Adelaide' (Nitschke & Tucker, 2010); and 'January 2009 heatwave in Victoria: an assessment of health impacts' (Dept. of Human Services, 2009).	Many such reviews have occurred internationally related to this increasing natural hazard risk. The UN Office for the Coordination of Humanitarian Affairs identify heatwaves as a risk which will challenge humanity into the next century. In taking heed, there is a growing need for providing enhanced understanding of the risks, with the Australian Climate Service developed as a repository for research into the hazard. From this, localised products for each jurisdiction have been developed, with SA and Victoria providing required information for communities in preparing for and living with these events.
Yarloop Bushfire, WA, 2016; widespread damage; 2 fatalities; $71million insurance costs.	'Reframing Rural Fire Management - Report of the special inquiry into the January 2016 Waroona Fire' (Ferguson, 2016).	Changes to bushfire related processes had resulted from different reviews, with the Ferguson review 2016 the impetus for major reform to the Western Australian bushfire model. The establishment of a Rural Fire Division within the Dept. of Fire and Emergency Services, and the opening of the Bushfire Centre of Excellence were two such significant improvements. With the management of all rural fire services remaining disparate and reliant on 70 year old legislation however it could be summised that the most significant improvements to bushfire management within WA are yet to be achieved.
Black Summer Bushfires, NSW, VIC, SA and QLD, 2019-20; widespread damage; 33 fatalities; estimates of $10billion insurance costs.	'Royal Commission into National Natural Disaster Arrangements' (Commonwealth of Australia, 2020).	The findings of this Royal Commission were many and varied, with one aspect being that the differences between the existing emergency management arrangements across the jurisdictions were vast, with mechanisms enabling the sharing of resources based on an approach of agency evolution rather than that of public oversight and assurance. With the following review of these recommendations by Dr. Robert Glasser due for public release in late 2024*, there is potential to provide the way forward to a more consistent national approach.

* Consideration of the 'Independent Review of the National Natural Disaster Governance Arrangements' (Glasser, 2024) pending by Federal Government late 2024.

Table 1: Examples of selected natural hazard events [further detail of each provided through the QR Code below].

What could be done to improve situation:

Whilst changing legislation may be impractical, a review of policy across each jurisdiction to consider a more harmonised approach may not. Ultimately this could be more appropriate considering the increasing national risks due to the growing impacts of climate change across the identified consequence categories of people, economy, public administration, infrastructure, social setting, and the environment.

How to get involved!

Where to from here: Research focus will occur throughout 2026 across a multi-jurisdictional approach. The research team will seek a number of representatives from peak emergency management bodies within each jurisdiction to participate to identify current policy and the potential to achieve an increasingly harmonised approach to the Australian Emergency Management Arrangements.

Researcher: Brad Slater as a PhD Candidate at Edith Cowan University, and Associate Student with Natural Hazards Research Australia, will lead the research project.

FRRR
Foundation for Rural Regional Renewal

SMALL GRANTS = BIG IMPACT

Each year, the Foundation for Rural and Regional Renewal, or FRRR, as it is known to the many communities across remote, rural and regional Australia, provide a significant number of small grants, usually up to $25,000, to locally based, often small, not for profit organisations that support communities to recover from, or prepare for future disasters and climate impacts.

These small, highly localised grants deliver significant impact and outcomes; often many times beyond their financial value and immediate project outcomes.

As a result of the grant and project, communities commonly report:

- improved confidence and optimism within the group and wider community,
- increased in-kind support and local sponsorship,
- a wider profile, trust and recognition of their work,
- the project led to additional community connections, networks, & partnerships
- the momentum has enabled them to take on broader projects and initiatives.

This is a small selection of projects that profile the diversity of recovery and preparedness projects that FRRR enable each year.

$11.1 Million
invested in recovery and preparedness during 2022/2023

427
Projects supported to enable recovery and preparedness during 2022/2023

Deddick Valley Isolated Community Group

Location: Goongerah and Tubbut (Victoria)
Program: Strengthening Rural Communities Prepare & Recover
Grant: $24,680 + $24,750

Deddick Valley Isolated Community Group supports residents living in the 56 km long valley (population 338) in some of Victoria's most isolated and remote communities. Impacted by Black Summer bushfires, accessible health care is a priority for the region with services an average of 230km drive away.

FRRR supported Stage one and Stage two of the project to firstly identify community needs and the feasibility of establishing medical and service hubs in Goongerah and Tubbutt as pilot sites, and later to establish the provision of access to health and other services in Stage 2. This involved converting a vacant room each in the Goongerah and Tubbut community halls into a private, technology enabled consulting room for both virtual health and in person appointments from visiting health services.

Kin Kin Community Group

Location: Kin Kin (Qld)
Program: Suncorp Rebuilding Futures
Grant: $25,000

For the isolated region of Kin Kin and surrounding communities, the February 2022 floods highlighted that volunteers supporting this district were under resourced. Recognising the local impact on power, communications, drinking water, supplies and general volunteer operations in the event of a disaster, the project supported volunteers through purchasing office equipment/ supplies, emergency medical equipment (first aid kits and debribrillator) and drinking water solutions.

They also set up a volunteer and Emergency Hub within their local Community House as a place to come together and for use in emergency response. The Hub has provided free volunteer first aid training, a series of disaster recovery art workshops, and a volunteer care program, register and newsletter.

Prospect Hill Community Association

Location: Prospect Hill (SA)
Program: FRRR Disaster Resilience and Recovery Fund
Grant: $9,195

The Prospect Hill Assist: Disaster Readiness Communications Project has supported local volunteers to continue locally led fire emergency preparedness by purchasing practical communications and safety equipment such as windup torches, a generator, radios and high visibility safety wear to improve communication, and coordination of their self organising systems for emergency shelter, catering, pets, and coordination with external emergency management services situated outside their locality during disaster events.

Prospect Hill is in a unique, but isolated geographical location in the Adelaide Hills of South Australia, in close proximity to Kuitpo Forest.

Support our work

FRRR is reliant on the generosity of donors; both small and large, to enable this important disaster recovery and preparedness work.

To make a donation, or explore a partnership opportunity with FRRR, please visit: www.frrr.org.au/giving, or phone 03 5430 2399 and speak to the Partnerships Team.

For more information about FRRR's Disaster Recovery and Climate Resilience programs and initiatives, contact Nina O'Brien n.obrien@frrr.org.au, or stop by Resilience Lane to say hello!
www.frrr.org.au

Transforming Disaster Assistance in Canada

Carly Benson & Sheila Gordon
Public Safety Canada

INTRODUCTION

The Disaster Financial Assistance Arrangements (DFAA) Program, created in 1970, is the mechanism for the Government of Canada to provide financial support to provinces for large-scale disasters. In 2022, Public Safety Canada began work to modernize the program as Canada faces rising disaster frequency, impacts, and costs.

How It Works

Once a province's disaster costs exceed the program's financial threshold (based on a per capita formula), the federal program reimburses the province for eligible expenses supporting:

- Response (disaster countermeasures)
- Relief measures (for up to 6 months)
- The repair/rebuild of uninsurable homes, small businesses, and public sector property to pre-disaster conditions

What It Does Well

The program scales up to provide greater federal support for more expensive disasters.

Unintended Consequences

The program contributes to incentives for developing high-risk areas and underinvesting in disaster risk reduction, because a significant portion of response and recovery costs are passed to the federal government.

PROCESS

Program Review

We conducted a comprehensive review that included trend analyses, a literature review, engagement with partners, and a Minister-appointed advisory panel. The review found gaps in how the DFAA Program aligns with other government strategies and emphasized the need to take a systems-level view of risk and improve recovery outcomes.

Policy Direction

Based on the review, our team secured a policy mandate to develop a new program that targets federal funding towards building resilience, reducing risk, and supporting people.

Program Design

In modernizing the DFAA, we used human-centered design to blend the top-down policy direction with a bottom-up approach to program design, putting disaster survivors at the center.

Program Launch

The new program launches on April 1, 2025.

HUMAN-CENTERED PROGRAM DESIGN

We conducted **12 human-centered design workshops** across Canada, visiting all provinces (except Nunavut) over four months. The workshops used disaster scenarios and different personas to explore the needs, values, and challenges in disaster recovery. We designed the personas based on interviews conducted with key partners to ensure they reflected real recovery experiences and adapted them to reflect unique regional conditions.

Workshop participants then grouped the recovery activities into thematic areas based on how a provincial government could provide effective recovery support. The workshops concluded with a group discussion of the top priorities in each province.

Recovery Perspectives Explored

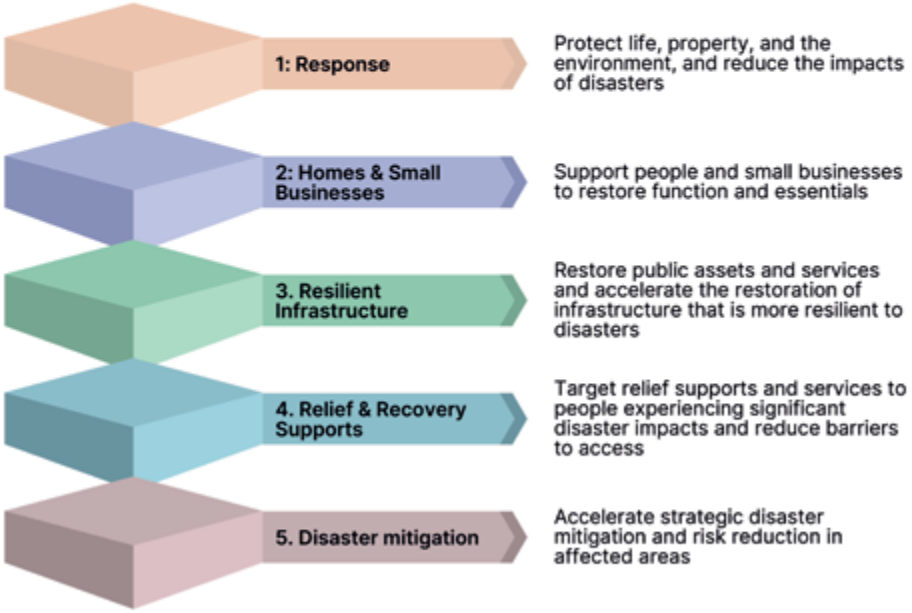
We used the following recovery perspectives used during the workshops and explored intractable recovery challenges that connect to larger societal issues. Even though a disaster recovery program cannot tackle all societal problems, our goal was to center recovery within the broader context.

Small businesses & non-profits	• Staffing shortages • Insufficient capital • Increased demand for social services • Resource scarcity
Homeowners & tenants	• Fixed incomes • Under-insurance • Poverty • Isolation • Affordable housing
Local & provincial governments	• Affordable housing • Supply chain issues • Insufficient expertise • Competing demands and priorities

Homeowner Persona:
Morgan is a 76-year-old retired plumber on a fixed income whose home was damaged in a flood.

RESULTS: A MODERNIZED PROGRAM

Public Safety Canada has completely re-designed the DFAA Program into five funding streams based on distinct but connected policy objectives that work together as building blocks to advance disaster resiliency in Canada.



For more information about Public Safety Canada's approach to modernizing the Disaster Financial Assistance Arrangements or further details on the new program, please contact Carly Benson at carly.benson@ps-sp.gc.ca or Sheila Gordon at Sheila.gordon@ps-sp.gc.ca

An ecosystem services economy can build a Forever Economy with and for Martuwarra Living Waters

Oscar Metcalfe,[1] A/Prof Kamal Sangha,[1] Prof Jeremy Russell-Smith,[1] Prof Anne Poelina,[1,2] Lachie Carracher,[2] and Prof Robert Costanza[3]

[1] Research Institute for the Environment and Livelihoods, Charles Darwin University, NT
[2] Martuwarra Fitzroy River Council, WA
[3] Institute for Global Prosperity, University College London, UK

Weaving a Forever Economy with and for Martuwarra Living Waters

Aim: to promote a (re)indigenised, circular Forever Economy for market and non-market benefits that operates holistically for the wellbeing of people and Country. An ecosystem services approach reinternalises externalities in valuations, building capability and an economy through, with and for people, culture and Country.

Martuwarra Living Waters / Fitzroy River WA

Martuwarra Living Waters is an entity of Country that relates in ecokincentric, mutually-reciprocal, *owneeship* with its people.

The present economy of the Fitzroy River (Martuwarra) watershed in the Kimberley, WA, is predominantly extractive and exclusory of Indigenous people; it values nature as an extractable resource with costs externalised accrued locally while benefits flow from the region.[1] An ecosystem services (ES)-based economy grounded in Indigenous worldview, knowledge and values would be holistic, circular, inclusive and embrace complexity for the long-term wellbeing of both people and nature/Country,[2] hence a Forever Economy.[3]

Economic situational analysis, current and potential futures

An economic situational analysis will illuminate the economies current and potential market and non-market costs and benefits. For example, pastoralism (beef cattle grazing) is the main land use across the region, with negative externalities such as soil erosion and greenhouse gas emissions not valued in prices and thus weaken governing market signals.[4]

Negative and positive externalities are omitted for other land uses:

- mining and unconventional/fracked gas (long-term impacts)
- cropping agriculture, e.g. cotton (extensive water use)
- hydrogen production (extensive water use)
- conservation (parks, modified pastoralism, savannah burning) and
- tourism (intra and inter-generational knowledge transfer).

Re-internalising externalities supports economic development and long-term wellbeing of people and Country,[1] existential and fundamental to Indigenous identity, wellbeing and rights.[5]

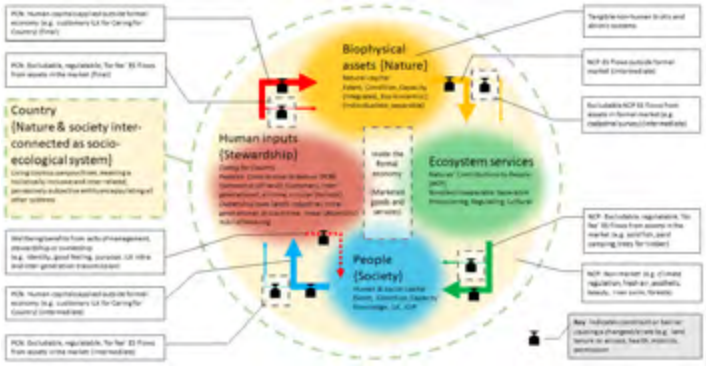


Figure: Conceptual model of Indigenous perspective of socio-ecological system showing multidirectional benefit ES flows, from Jarvis et al. (2022), Larson et al. (2023), Normyle, Doran et al. (2022); Normyle, Vardon & Doran (2022), Stoeckl et al. (2022), Wooltorton et al. (2022) and colleagues' publications. 1st author's diagram.

Exploring Martuwarra with weaving and systems dynamics

Exploration of economic system dynamics is proposed with and through Martuwarra Fitzroy River Council via a co-produced case study using weaving, where diverse knowledges are cautiously and respectfully brought together for new insights.[6] Systems dynamics modelling can support discussion and help explore complex socio-ecological systems and benefit flows (see figure)[7] for leverage points[8] toward place-specific ecosystem service-based economies.[9]

1. Russell-Smith, J. et al. (eds), 2019, Sustainable land sector development in northern Australia: Indigenous rights, aspirations, and cultural responsibilities.
2. Poelina, A. et al., 2023. Learning to care for Dangaba. Aust. J. Environ. Educ. 39, 375–389.
3. Australian Conservation Foundation, 2021. Forging the Forever Industries–How ancient wisdom can guide the transition to new economies.
4. Russell-Smith, J., Sangha, K.K., 2018. Emerging opportunities for developing a diversified land sector economy in Australia's northern savannas. Rangel. J. 40, 315.
5. RiverOfLife, et al., 2023. Martuwarra Fitzroy River watershed: One society, one river law. PLOS Water.
6. Hill, R., et al., 2022. Learning together for and with the Martuwarra Fitzroy River. Sustain. Sci. 17.
7. Stoeckl, N. et al., 2016. Integrated models, frameworks and decision support tools to guide management and planning in Northern Australia. Northern Australia Environmental Resources Hub.
8. Meadows, D.H., 1999. Leverage points—Places to intervene in a system.
9. Sangha, K.K. et al. 2022. Ecosystem services and human wellbeing-based approaches can help transform our economies. Front. Ecol. Evol., Conservation and Restoration Ecology 10.

Further information

For additional information scan the QR code or contact:
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Healthy North Coast

Community Wellbeing and Resilience Program

Investing in community connection – the evolution of learning

The Northern NSW context

The North Coast of NSW is an identified disaster 'hotspot' in Australia.[1,2,3,4] In recent years, the region has experienced widespread bushfires (2019/2020), the COVID pandemic (2020), followed by major (2021) and then catastrophic (2022) flooding.

Within this context, the region provides a unique testing ground for community resilience initiatives. Healthy North Coast is committed to supporting **innovative, coordinated, and sustainable action and investment to reduce these future costs.**

$5.3M invested in community resilience

The Community Wellbeing and Resilience Program

Healthy North Coast developed the *Community Wellbeing and Resilience Program* to invest **in place-based initiatives that support communities in recovering from the impacts of natural disasters and building their capacity to face future cascading challenges.** The targeted funding focuses on building resilience through strong social connections. The initiative has been independently evaluated to support continuous quality improvement.

What we learned from the program to date

Enablers

- **Funding flexibility**
- **Project changes to meet community needs**
- **Project teams with local knowledge**

Barriers

- **Community readiness and fatigue**
- **Short-term funding**
- **Building community trust**
- **Creating lasting change**

Outcomes - phase one

Evaluation findings indicated that the most robust, sustainable and impactful community outcomes came from initiatives that supported:

- local knowledge and leadership
- building social capital
- practical place-based solutions.

23 place-based initiatives delivered

Insights

The most resilient communities are those that are the most connected.[5,6] This includes the social fabric of the community service system. **Healthy North Coast has observed the critical link between resilience in the community and in the community service sector.**

Healthy North Coast consultations suggest that competitive grant-making weakens the social fabric that community resilience relies upon in disaster recovery[7,8]. **This is an important call for reflection for funding organisations that work to support community resilience in post-disaster spaces.**

2024 participatory grant-making

Evolving to a more connective process

Preliminary evaluation findings and research have demonstrated **that competitive grant-making** can create an environment of distrust and separation, **impacting the social fabric of a sector already burnt out and fatigued.**[7,8,9]

Consultation

Sector consultation and dissemination of learnings showed that **the local community services sector supported a trial of a participatory grant-making (PGM) approach**

Sector willingness to innovate

The sector expressed an appetite to:

- trial a community-centred approach
- collaborate with others and strengthen partnerships
- get feedback on their proposals / workshop project ideas with their peers
- be involved in funding decisions.

Healthy North Coast worked with external probity advisors to ensure the PGM design was rigorous and equitable in its design.

Aims of the participatory grant-making approach

Healthy North Coast delivered its first PGM approach for the 2024 Community Wellbeing and Resilience Grants Program.

The PGM process sought to allocate $1 million in funding to support community wellbeing and resilience. The 2024 PGM approach aimed to:

1. Strengthen relationships between funders and the community
2. Prioritise trust and collaboration over competition
3. Build local capacity for future grant-seeking
4. Allocate funding in an accountable and transparent way

The process involved

An extended EOI opening period:
Allowed community organisations to plan and consider their applications.

Workshop 1: Practice pitch and peer feedback
Seven shortlisted participants practiced their project pitch and received feedback from their peers and Healthy North Coast's commissioning and project teams.

In the two weeks between the workshops, participants were provided:
(1) synthesised feedback on their EOI, pitch and proposal pulled together from their peers, and the Healthy North Coast Project Team and EOI Evaluation Panel and

(2) a 1:1 coaching session with an independent facilitator.

Workshop 2: Final pitch and voting
Each organisation presented its project to its peers, a group of observers and selected community representatives.

Voting members (the shortlisted organisations, as well as eight community experts), evaluated each project.

The PGM approach was very well received by the sector:

"far preferable to conventional approaches"

"generous, decolonising process"

Participants rated the process highly:

4.5/5 for likeliness to participate in a process like this in the future

Scan the QR code to access references, for further information or to download this poster

Local people leading the way to building disaster resilience in the Burnett Inland (Qld)

Background to the program

For nearly 25 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 local people in remote, rural, and regional communities have the knowledge to best respond to the impacts of climate and disasters where they live.
Last year alone, FRRR invested $22.5 million in small, grassroots non-profit organisations across Australia; 49% of which related to disaster recovery and preparedness.
While small grants are one way this is activated at a national scale, FRRR also works at depth in specific regions, through partnerships with local organisations to build skills, knowledge, networks and capacity, to build a meaningful legacy in locally based organisations for the future; on terms that match local need and context.

A shared meal is an important part of the community meeting at Dallarnil as they work through the priority areas in their Roadmap to Resilience. Dogs are also welcome to attend.

Disaster Resilient: Future Ready Burnett Inland (Qld)

DR:FR BI is an initiative that supports local community members, grassroots community organisations and community networks across the Burnett Inland region to develop and lead initiatives that strengthen awareness, increase preparedness and enhance capacity of the local community to thrive and be resilient to the impacts of climate, disasters and other disruptions. The three-year project is a collaborative delivery approach between FRRR and locally based Red Earth Community Foundation (Red Earth).

Red Earth exists to invest in people and act as a catalyst for the Burnett region (North Burnett, South Burnett and Cherbourg) to thrive into the future. As a philanthropic organisation, Red Earth provides a vehicle for all to secure the Burnett's future potential through support for young people; responding to challenges; encouraging creativity, strengthening entrepreneurship and leadership; celebrating and showcasing local successes, and so much more.

As local delivery partner, Red Earth has worked with FRRR, and the six Burnett Inland communities of Tansey, Dallarnil, Cherbourg, Kalpower, Proston and Kumbia, and regional stakeholders to inform the program approach and implementation, co-ordinate program activities, harness local knowledge and networks, and ensure that all aspects of the project bring value to the Burnett Inland region.

Starting in 2023, and continuing into 2025; FRRR and Red Earth are working with community members, local organisations and regional stakeholders to build local knowledge of climate risks, activate local leadership and foster collaboration through local level projects and infrastructure resourcing, in addition to region wide initiatives, training and events.

The program actively works to facilitate community-driven processes at a pace that suits the community, to strengthen the skills, capacity and resources to manage the impacts of future disaster, and elevate the voice of local people, particularly in isolated locations where people are required to have a greater level of self-sufficiency during disasters.

An important aspect of the work is also working in collaboration with local government to ensure efforts add value to, build knowledge of, and strengthen existing disaster management systems.

Our insights, so far:

- The approach: We both have unique organisational strengths that are critical to the success of the partnership. Red Earth bring a deep richness in local staff, knowledge, relationships and connection, while FRRR bring the theory, program management , grantmaking experience and donor funding to the table.
- Consider the long term legacy: We started with the end in mind, through a clear agreement and agreed way of working to define what program outcomes we wanted, and also for the long term legacy of the investment in the local region.
- Being flexible: While a theory informed approach is important, so too is understanding how diverse communities 'tick' across local regions or states in a practical way, and adapting the approach if required. Program flexiblity is critical to ensure initiatives are locally determined, make a practical diference, have broad community participation, do not replicate existing efforts, keep community members engaged, and build capacity in local organisations for the future.
- Patience is a virtue: Rome was not built in a day, and neither is good community driven disaster preparedness. A three year program delivery time is the minimum, but five is preferred to build genuine legacy, build on momentum, and learn in loops.
- The Soft Vs Hard conversation: Small communities often have very short term simple requests for basic 'hard' infrastructure and equipment, that then lead to deeper conversations about the longer term 'soft' human focused systems, processes and theory. Both 'hard' and 'soft' are critical, but it is important to allow communities to start where it suits them.
- More money does not = greater impact: Often communities have modest requests, and small injections of money can equate to significant impact when developed collaboratively over time. We do not start the conversation with the money in mind, as it often gets in the road of good ideas.
- Trust and Humour: Delivering long term projects in communities, and working alongside not for profit organisations that are at varying levels of readiness, capacity and previous disaster impacts can be challenging and delicate but highly rewarding. A high level of trust, and solid dose of humour is required to build good relationships, make safe mistakes and learn as you go.

Questions?

To learn more about FRRR community-led resilience building initiatives and the diverse ways we support communities, visit FRRR at Resilience Lane, or scan the QR code.

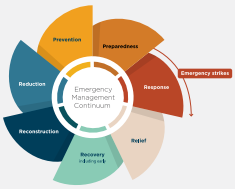
For more information about FRRR's Disaster Recovery and Climate Resilience programs and initiatives, contact Nina O'Brien
n.obrien@frrr.org.au

Acknowledgement

The program has been made possible through the financial support of the National Emergency Management Agency (NEMA) Preparing Australian Communities - Local Stream and Minderoo Foundation.

For more information visit:
www.frrr.org.au
www.redearth.org.au

Disaster Ready Fund



What is the Disaster Ready Fund?

- The Disaster Ready Fund (DRF) is the Australian Government's flagship disaster resilience and risk reduction initiative, providing up to $1 billion over five years from 2023/24 to help communities better prepare for and protect themselves against the impacts of a broad range of natural hazards. The DRF is a competitive grants process, delivered in partnership with state and territory governments.
- The DRF's objectives are to:
  1. increase the understanding of natural hazard disaster impacts, as a first step towards reducing disaster impacts in the future;
  2. increase the resilience, adaptive capacity and/or preparedness of governments, community service organisations and affected communities to minimise the potential impact of natural hazards and avert disasters; and
  3. reduce the exposure to risk, harm and/or severity of a natural hazard's impacts, including reducing the recovery burden for governments, cohorts at disproportionate disaster risk, and/or affected communities.

Key elements of the Disaster Ready Fund

- DRF funding is available for projects that build community resilience to a broad range of eligible hazard types including geological hazards such as earthquakes, landslides and tsunamis; and/or extreme weather and climate driven hazards such as bushfire, cyclones, floods and heatwaves.
- There are two activity streams: infrastructure and systemic risk reduction.
- The DRF is delivered in partnership with states and territories in recognition of the key role they play in disaster risk reduction and resilience within their jurisdictions. Each jurisdiction nominated a Lead Agency responsible for emergency management through which all applications within the state or territory were submitted.
- Applicants are expected to provide a co-contribution of at least 50 percent of the project expenditure (either cash or in-kind), with requests for waivers of this requirement considered in exceptional circumstances.

Round One snapshot

- On June 7 2023, the Minister for Emergency Management announced 187 projects sharing in $200 million in Commonwealth funding under Round One.

Bushfires/wildfires	$89,075,771
10%	$89,075,771
Storms and tropical cyclones	$110,923,589
Severe thunderstorms, hailstorms and blizzards	$104,098,292
Pollen storms	$17,990,369
26%	$233,012,250
Floods, flash flooding, including storm surges	$146,240,666
16%	$146,240,666
Earthquakes	$26,001,276
Avalanches, mudslides and landslides	$14,007,779
Sinkholes	$12,261,118
Volcanic eruptions	$6,855,618
7%	$59,125,791
East Coast lows	$69,255,871
Heatwaves	$68,672,606
Damaging wind incidents, including but not limited to dust storms and tornados	$68,475,395
Coastal erosion, and coastal inundation	$66,574,472
Sea level change	$56,294,976
Tsunamis	$16,441,752
Other	$11,361,772
Geomagnetic solar storms (X or M Class)	$10,119,250
41%	$367,196,094

Note: Many projects identified as covering more than one hazard type. Projects may be counted more than once.

Round One outcomes include:

- Over 100 projects to be led or jointly delivered by councils or local government entities (approx. $97 million in Commonwealth investment).
- 11 projects involving not-for-profit organisations and charities as delivery partners (approx. $12 million Commonwealth investment).
- 74 infrastructure projects, including projects for the development of plans or business cases for infrastructure (approx. $64.5 million Commonwealth investment).
- 74 risk reduction projects (approx. $84 million Commonwealth investment).
- 67 projects which self-identified as benefiting First Nations Peoples (approx. $88 million in Commonwealth investment).
- Projects that build capacity and capability within at-risk communities and cohorts at disproportionate disaster risk, including: First Nations communities; Culturally and Linguistically Diverse (CALD) communities; migrant and refugee communities; people with a disability; LGBTQIA+ communities; children and young people; people over the age of 65; and, those experiencing homelessness, unemployment or poverty.

Find out more about the Disaster Ready Fund and have your say on the design of Round Three through NEMA's 2024 survey.

Photo credit: Makers Empire, Bushfire Kids Connect, and Growing with Gratitude

Case Study One

Bushfire Kids Connect – NSW

Bushfire Kids Connect, Growing with Gratitude and Makers Empire are working together to strengthen young people's voices in communities vulnerable to disasters or impacted by recent disasters. The school-based program will help students understand the highest potential disaster risk in their local community context, teach them why disasters happen and how they are controlled. It aims to empower students as problem solvers and creative designers who can make a difference in their families lives. Students will use design-thinking problem solving methodology and 3D design, to create solutions to increase habitat resilience and support healthy plants, animals and ecosystems. The program will include a Disaster Ready Resilience online module available for schools and aims to get young people involved and active in volunteering and community activities. The project will target hazard types that are relevant or most likely to occur in the location specific to the young person's school and community, including bushfires, floods, severe thunderstorms and storms/tropical cyclones.

Total project value	**$1,293,832**	**Commonwealth contribution:**	**$643,832**

Photo credit: Forestry Corporation NSW

Case Study Two

Fire, Country and People: Aboriginal Community Disaster Ready Partnership

This project partners with local aboriginal communities on the NSW North Coast to incorporate traditional fire practice into Forestry Corporation forest estate fire management. It will support Aboriginal communities on Aboriginal owned land to plan ahead for the prevention and management of fire and other natural hazards. This project will establish strategic partnerships between the communities and stakeholders involved in fire management, maintain and or enhance asset protection zones around vulnerable communities, increase the resilience and adaptive capacity of these communities, while minimising the potential impacts of bushfire events. The project will:

- build and maintain an evidence base of natural hazard risks and impacts, and the benefits of incorporating traditional ecological knowledge and practices.
- facilitate positive and practical Aboriginal community and Country management stakeholder co-design principals and agreements.
- train, employ, and contract Aboriginal disaster readiness and response teams value adding to existing and emerging Aboriginal Ranger programs.

Total project value	**$2,957,632**	**Commonwealth contribution:**	**$1,477,632**

RISKING IT THROUGH INNOVATION

Fire and Emergency New Zealand's organisational risk landscape needed a reset. The Assurance and Risk team has led an innovative risk programme and developed an organisational risk landscape to support focused risk management.

Fire and Emergency is the first public sector agency to take this approach. Our focus has been on implementing innovative and thought-driven risk management to raise the overall risk maturity of the organisation.

Fire and Emergency tested and refined its risk framework and roadmap via a series of prototypes:

WHAT WE DID

The team developed a strategic risk framework and roadmap for Fire and Emergency's Executive Leadership Team (ELT).

Clarifying roles and responsibilities and using this as a teaching lever

- We have clarified roles and responsibilities across the newly designed risk landscape.
- We have also created risk mindset cards for all role holders which has assisted role holders to understand the role they play.

Bringing the organisation together to manage risk collectively

- We collated risk themes across the organisation, analysed duplicate risks and formed up an enterprise risk layer of our landscape.
- Risk management groups with cross organisational staff now come together quarterly to discuss risk themes.
- We have worked with the business to understand the data sets that needed to be mapped to enterprise risks to allow for key risk indicators to be used for better risk discussions.

Designing a connection pathway between risk and governance

- We outlined the roles of the ELT and ELT subcommittees.

THE INNOVATION

The organisational risk landscape has three layers, **strategic risks**, **enterprise risks** and **operational risks**. It was designed to:

- widen our narrow view of risks and ensure we focus on areas that truly matter to our organisation
- collaborate, learn and share information to remove risk barriers
- provide structure and boundaries for how we as an organisation identify, analyse, mitigate, manage, treat and monitor risks
- foster better organisational discussions on mitigations, treatments and ownership.

KEY OUTCOMES

The work has assisted our organisation to manage risks:

- The digestible format of the risk information has made it easier for our people to ask questions and use the information in decision making.
- Using language on the placemats that is relatable has enabled our people to use risk language more frequently.
- The information to the Audit and Risk Committee has enabled our governance layer to have better insights into the risks our organisation faces.
- The team has developed a building block to connect the risk management landscape with our organisational governance committees.

MEENA PATEL

Meena has 15 years experience as a seasoned risk and assurance practitioner and her passion lies in strengthening organisational and programme governance, risk management and accountability, focusing on effectiveness and efficiency. Meena supports leaders to ensure they have the right risk and assurance focus and works with the executive to build out risk culture and enhance capability.

assuranceandrisk@fireandemergency.nz

SIOBHAN CARMICHAEL

Siobhan has over 8 years of experience in risk and assurance across a range of sectors, with a focus on making risk management easy to understand and embedded in what we do. As Principal Risk Advisor at Fire and Emergency her role is to support us to improve how we manage risk and uncertainty to achieve our objectives.

siobhan.carmichael@fireandemergency.nz

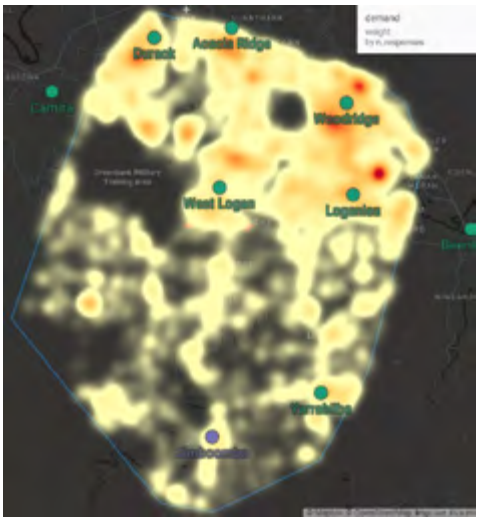
Optimising Emergency Response: A Data-Driven Approach to Fire Station Placement

Doris He, Anthony North
Queensland Fire Department

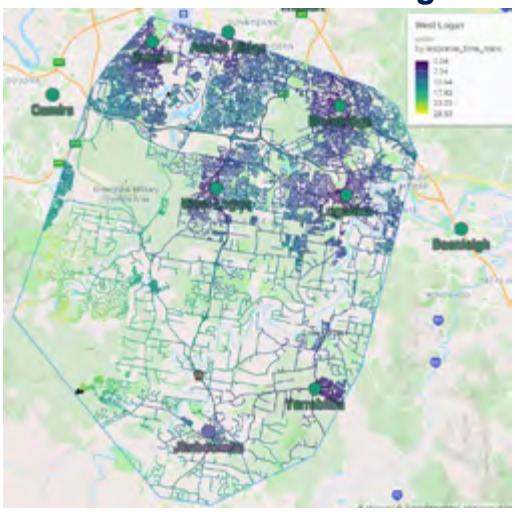
QFD launches a pioneering initiative to transform fire station placement strategy, moving from traditional methods to a dynamic, data-driven model. Leveraging advanced data science, QFD employs a specialised routing simulation for fire trucks, enabling a granular analysis of response times and incident demands to guide evidence-based decision making.

Case Study

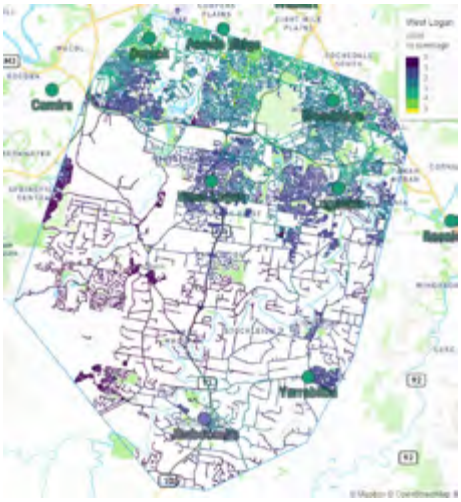
Relocation of West Logan



Incident demand analysis



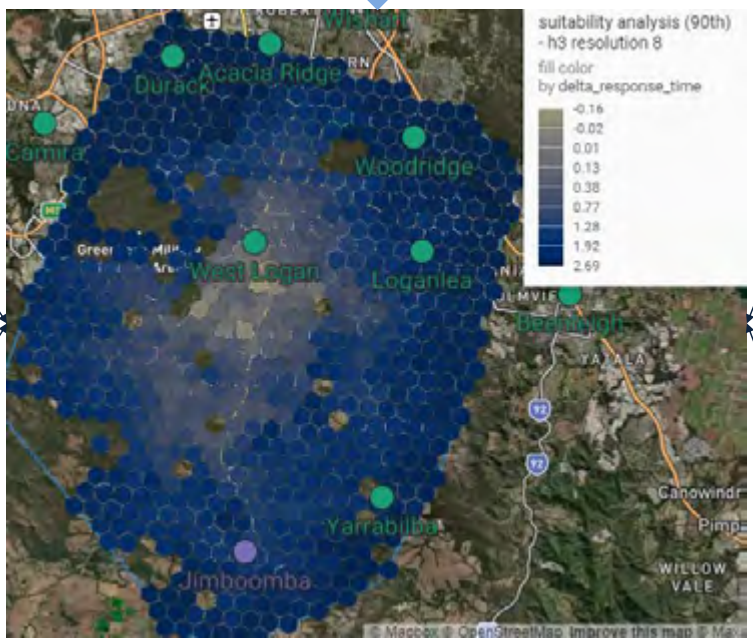
Response isochrone analysis



Response coverage analysis

Simulate incident demand based on statistical modelling of historical incidents

Build statistical model to calculate response turnout times



Hexagonal map visualisation optimising response time

Utilise the Open Street Routing Machine to estimate realistic travel times

Location sampling for target station and response time calculation

Implications

This project outlines a comprehensive and innovative project that not only redefines fire station placements but also embodies a cultural shift towards data-driven decision-making within the QFD. It is a prime example of leveraging cutting-edge technology to enhance emergency response capabilities and adapt proactively to the ever-changing needs of the community.

Contact: doris.he@fire.qld.gov.au

Respect Integrity Courage Loyalty Trust

Queensland Government

hatz.com.au

Hatz Engines
Always ready when needed

Fire and emergency services face numerous challenges during their everyday life. Dangerous operations combined with short response times are a daily occurrence. Imagine a bushfire breaking out in a high-risk area. In such cases, the fastest and smoothest possible procedure is essential for life and limb. The last thing you want to worry about is the condition of emergency appliances and critical equipment such as water pumps.

Hatz supports as a strong partner when it comes to meet these challenges by providing innovative **software** and **hardware** solutions. Therefore, one cannot only rely on the robustness and durability of Hatz engines but also on comprehensive and customer-specific data.

What's the problem?

Engine of water pump fails

- Mission critical application, thus life depends on function
- Substitution (new truck with water pump) necessary? Which info is needed for whom?
- Complicated condition monitoring systems not feasible for volunteers

010101
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How we support in solving

Digitally connected Hatz engines (or third-party engines) featuring **Performance Tracking** provide valuable information to minimize the risk of failure:

- Condition tracking of engines via error code display to estimate risk level for emergency personnel:
  1st scenario: Engine displays no error code
  → small risk for people
  2nd scenario: Engine displays error code
  → high risk for people
- Automatic engine information for workshops regarding error code, location and usage to lower risk for emergency personell
- Easy usage thus no training for volunteers needed

Learn more about Hatz Performance Tracking

hatz.digital

What does Hatz Digital Solutions do?

- Keep your machine fleet ready for use
- Engine down time reduced
- Most engine parameters are visible
- Offers maintenance and repair optimization
- Optimise human resources working on engines
- Fast user-friendly way to monitor electronic engines
- Important information at your fingertips
- Knowing what is needed before you see the engine

Hatz engines – Ready when you are

Visit us @ our stand 284

Surf Life Saving NSW's journey of deploying learning to volunteer members through Canvas

Andrew Chan
Learning and Development Manager, SLSNSW

Paul Hardy
AUAVS Manager, Australian UAV Service

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

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.

Ensuring the organisation has the essential digital infrastructure to support the implementation of our value added digital learning initiatives is more important than ever.

Since 2021, SLSNSW started the journey of offering digital learning experiences to its members through Canvas, an interactive learning management platform.

The SLSNSW drone program has been a significant addition to our surf life saving operations. Drones provide enhanced surveillance capabilities, allowing us to monitor large areas of coastline more effectively than ever before, as well as assist in floods, fires, and missing people responses.

Our drone program includes a comprehensive training regimen to ensure that all operators are well-versed in the latest techniques and technologies. Using the Canvas platform, we deliver interactive and engaging training modules that cover everything from basic drone operations to advanced surveillance and rescue techniques. This training ensures that our volunteers are equipped with the skills they need to operate drones effectively and safely in real-world scenarios.

At this session, SLSNSW will share its digital learning strategy and how it is implemented to engage the new generation of UAV operators and volunteer trainers.

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

Bringing UAV Operator Induction to the Digital Space

"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 much 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 platform hosts many courses, including our UAV Operator Induction Program, a flagship package designed to train new drone operators for our service, in a digital format using the Canvas learning management platform.

Powered by Canvas, the program now offers participants a seamless and intuitive learning experience. This transformation allows members to develop their skills in UAV operation, mission planning, and emergency response in a safe and supportive online environment. Participants can engage in interactive modules, practical exercises, and detailed evaluations, ensuring comprehensive preparation for real-world operations.

The program's interactive nature supports diverse learning styles and paces, enhancing overall effectiveness.

By leveraging the power of Canvas, we provide a robust digital learning environment that equips our UAV Trainee Pilots with the necessary skills and knowledge to perform their duties efficiently and safely. This commitment to innovative training methods underscores our dedication to maintaining high standards in UAV operations, surf life saving and emergency response.

Meet Our Graduates

New-Age Field Ops

Navigating Emergencies with Real-Time Situational Awareness

With the rapid growth of location-powered technologies, there is an expectation for **timely** and **accurate** data capture and dissemination.

When disaster strikes, response teams rely on **scalable mobile solutions** to maintain real-time situational awareness as they navigate complex hazards unfolding in the field.

Natural disasters can strike in an instant. **Common operating pictures** of fundamental data are essential in supporting the emergency management .

Mobile applications enable authoritative data to be synced back to organisation systems. Through this infrastructure, organisations can **share** and **collaborate** across borders, jurisdictions and sectors to support a **coordinated response** to an event.

Whether collecting, modelling, storing, accessing, sharing, visualising, analysing or informing – spatial technology continues to evolve, allowing organisations to proactively **prepare, prevent, respond** & **recover**.

Author: Brandon Wilkinson
Senior Consultant, Solutions Engineering
Esri Australia

Booth 562

esri Australia

Bushfire Simulation in the Cloud

Increasing Operational Intelligence and Organisational Value

Simon Webster - Queensland Fire Department

1.Introduction

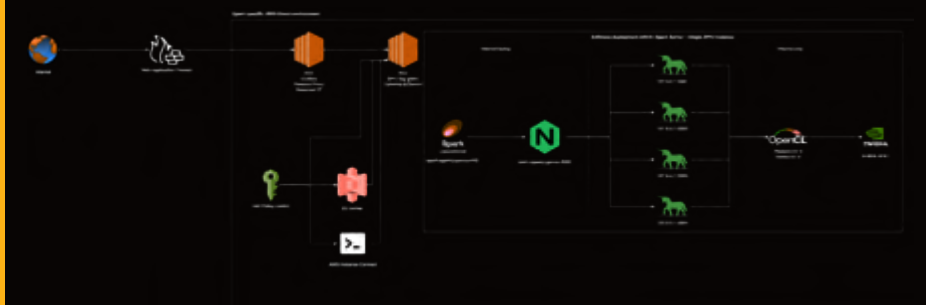
The Queensland Fire Department (QFD) is on the forefront of transforming its bushfire simulation capabilities by migrating to a cloud-based environment. This innovative shift, currently in the proof of concept phase, promises to deliver substantial organisational value by eliminating dependence on single PCs and high-end hardware, simplifying upgrades, and ensuring high reliability. The cloud platform offers easy access from any device and integrates seamlessly with various systems via APIs, significantly enhancing operational efficiency.

Migrating the Spark Operational bushfire simulator to the cloud allows QFD to ensure consistent and reliable access to critical simulation tools, irrespective of location or device, to a wide variety os users and systems. This approach supports the rapid scalability required during peak fire seasons and improves collaboration across different teams and agencies.

QFD has developed a shareable deployment pattern that is scalable, secure, and Spark-compatible. This pattern is designed with the latest best practices in cloud technology and is offered openly to other fire agencies as AFAC partners and project cocontributors through a shared GitHub repository, complete with detailed starting instructions and architecture. By adopting this innovative solution, QFD is not only enhancing its predictive accuracy and response readiness but also aligning with national strategies for unified, high-standard fire management practices.

The cloud-based solution reduces the complexity of managing and maintaining fire simulation software, allowing fire behaviour analysts to focus on their core mission of safeguarding communities. This transformation represents a significant step forward in operational intelligence and organisational value, positioning QFD as a leader in modern

2. Single Instance



3. Scaling Up & Out

The initial deployment pattern for QFD's cloud-based bushfire simulation environment involves a single instance setup, utilising a combination of NGINX and networking rules to enable multiple users to operate on a single machine. However, as we scale out, our architecture evolves to provide greater resilience, security, and flexibility, tailored for mission-critical operations.

Multiple Availability Zones: Utilising multiple Amazon Availability Zones (AZs) is crucial for mission-critical systems as it ensures high availability and fault tolerance. By distributing resources across different AZs, we mitigate the risk of a single point of failure, enhancing the reliability and uptime of our simulation services.

Separate Private VPCs: Each environment, including Development (Dev), User Acceptance Testing (UAT), Fire Behaviour Analyst Network (FBAN), and general production, is isolated within its own Virtual Private Cloud (VPC). This separation enhances security by isolating resources and minimising the attack surface. NAT gateways in each VPC facilitate secure internet access for resources without exposing them directly to the internet.

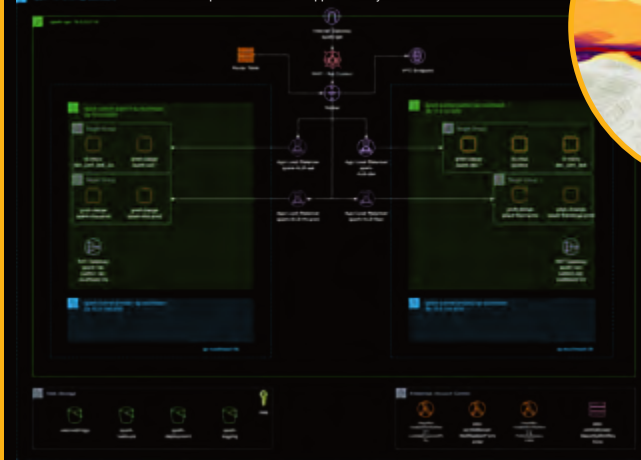
Target Groups and Load Balancers: To manage traffic efficiently, we have set up target groups for each environment. Load balancers distribute incoming traffic among instances within these target groups, ensuring optimal performance and reliability. This setup allows us to handle varying workloads seamlessly, especially during peak fire seasons.

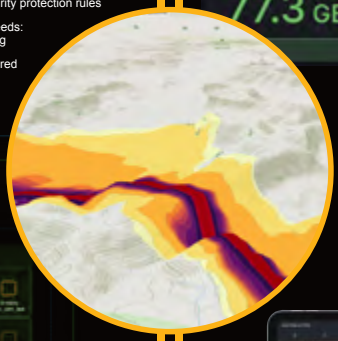
Web Application Firewall (WAF): Our environment includes a WAF with bot control and common security protection rules

S3 Buckets for Deployment, Backups, and Logs: We leverage S3 buckets for various operational needs:

- **Deployment Bucket**: Facilitates easy server setups by pulling necessary files and installing applications via deployment scripts.
- **Backups Bucket**: Stores simulation backups, ensuring data is preserved and can be restored when needed.
- **Logs Bucket**: Collects logs for monitoring and analysis, aiding in troubleshooting and performance optimization.

Scalability and Responsiveness: During highly active fire seasons, we can rapidly scale our environment. New instances can be provisioned within approximately 15minutes.



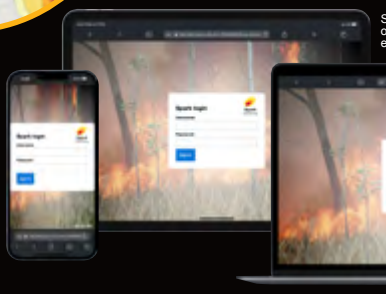


4. Measure and Monitor

Monitoring and Long Term Tracking

Monitoring for service health is crucial in a modern cloud-based solution, ensuring reliability and performance. In our deployment, each instance is equipped with a Prometheus-compatible metrics endpoint. Prometheus collects data every 15 seconds, storing it in a time series database with metrics tagged by Amazon EC2 instance ID and timestamp. This setup enables highly granular monitoring, including GPU resources, which AWS monitoring does not inherently do, and supports concurrent monitoring of multiple graphics cards. This not only affords us an instant and mobile accessible way to monitor deployments during busy periods, but also provides longitudinal metrics.

This detailed monitoring allowed us to identify a memory non-release scenario that could have caused issues during busy periods. By proactively addressing such potential problems, we ensure that our bushfire simulation environment remains robust and efficient, capable of handling high-demand situations without compromising performance or reliability.



Spark therefore becomes available from multiple types of devices, without the need for large downloads, elevated privileges, or high end compute capacity

5. Step Forward

Preparing to Deploy

We invite you to take the next steps and explore our scalable, secure, and Spark-compatible bushfire simulation environment. Reach out to us for access to our GitHub repository, where you will find detailed instructions on deploying the single instance method. By trying out this deployment, you can experience firsthand the benefits of our innovative cloud-based solution. Join us in enhancing bushfire management capabilities and ensuring the safety and well-being of our communities.

To get started with our bushfire simulation environment, you'll need an AWS account with access to GPU EC2 instances, the ability to deploy S3 buckets, and set up IAM policies. For safety and security, this account does not need to be connected to your organisation's network. Some familiarity with Linux will be beneficial, although the walkthrough for the single instance setup is designed to be reasonably comprehensive.

Our GitHub repository provides detailed instructions to guide you through the process, ensuring that you can quickly and efficiently deploy the environment. By meeting these basic requirements, you'll be equipped to harness the power of our scalable and secure cloud-based solution, enhancing your bushfire management capabilities.

Accessing the Github Repository

To access our GitHub repository and explore our bushfire simulation environment, simply scan the QR code on the right-hand side of this poster. By reaching out through the QR code, we will provide you with the necessary link to our GitHub repository.

We highly encourage agency developers and other interested parties to collaborate with us in solving deployment challenges. Your contributions are invaluable in refining and enhancing our solution. We welcome pull requests that improve our deployment process and address any issues you encounter. Additionally, logging issues related to deployment nice-to-haves helps us understand the community's needs and prioritise future developments.

Collaborative efforts ensure that our bushfire simulation environment continues to evolve and meet the demands of various agencies. By working together, we can enhance the resilience and efficiency of our tool, ultimately improving bushfire management capabilities. Join us in this collaborative journey, and let's build a more robust solution for safeguarding our communities. Scan the QR code to get started, and become a part of our growing network of contributors dedicated to advancing bushfire simulation technology.

6. Thanks

AFAC Spark Operational Team - Deb Sparks, Chantelle Obrien, Blair Darragh

Data61 - Will Swedosh

Tasmania Fire Service - Samuel Fergusson

Queensland Fire Department - Kenneth Wong, Peter Timmers, Andrew Wynne-Jones, Anthony Chun, Sai Sun, Emma Crameri, Joel Gordon, Damien Hatfield, Mandy Price, Russell Stephens-Peacock

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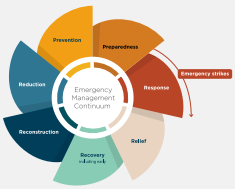
National Coordination Mechanism



The National Coordination Mechanism (NCM) is the convening mechanism that brings together Australian, state, territory and local government agencies, industry and non-government representatives for crisis coordination.

The NCM:

- Is flexible, scalable, and vector-agnostic.
- Facilitates rapid problem definition and shared situational awareness.
- Ensures ownership of solutions to drive the rapid stabilisation of crisis events.
- Uses a domain or sector-based approach to promote collaboration between stakeholders with equities in the crisis.
- Strengthens and formalises the existing relationships between governments, industry, and civil society.
- Enables collective national capabilities to be harnessed.
- Leverages existing authorities, legislation and policies.

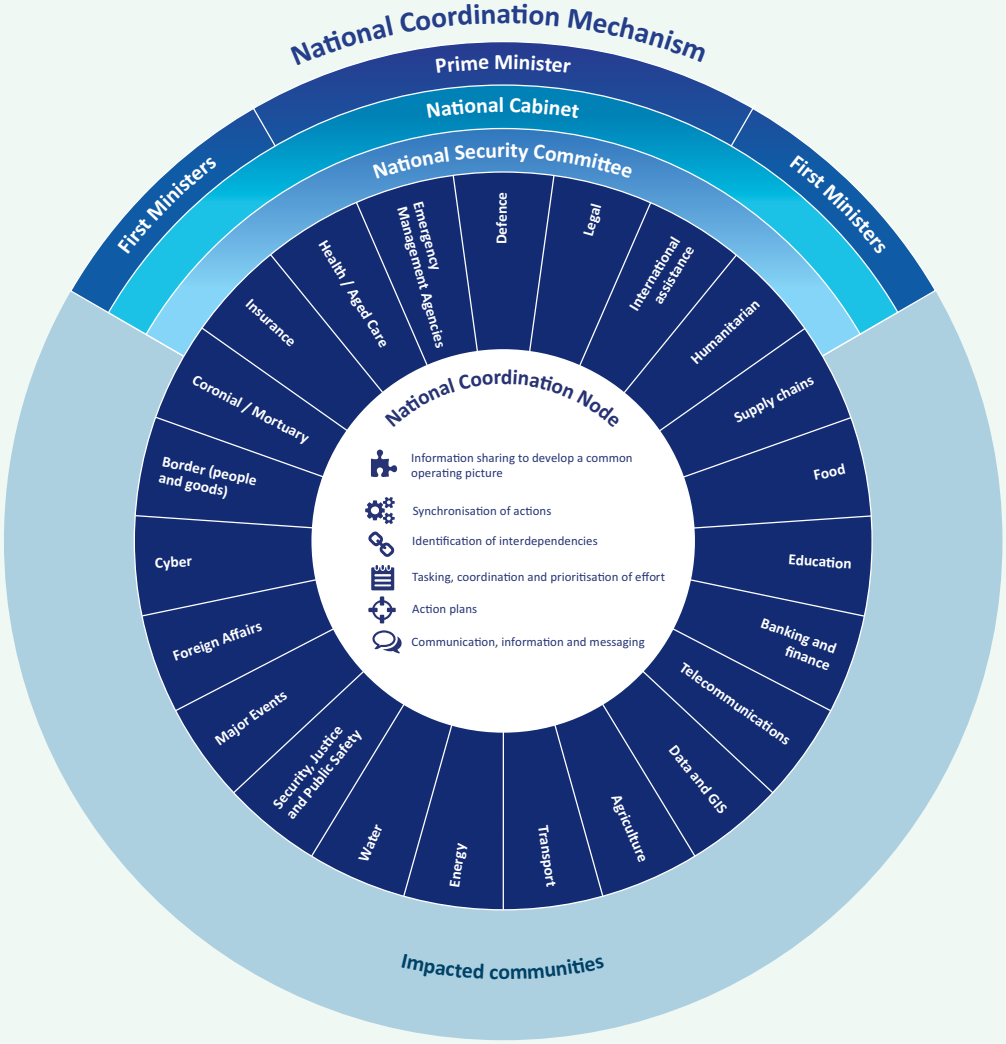
During crisis, the strategic aims of the NCM are to:

1. maintain near real-time situational awareness
2. ensure national leadership and the maintenance of public trust in government systems
3. ensure that actions are synchronised, coordinated, and responsive
4. ensure that the problem is clearly defined and understood
5. agree on lines of effort to mitigate the impacts and consequences of a national crisis
6. support the continuity of critical community functions
7. communicate actions and coordinate public messaging
8. reduce harm and the overall severity of the crisis

NEMA convenes and chairs the NCM on behalf of the Australian Government. Other relevant Australian Government agencies may co-chair, at the request of the chair or where they are the Australian Government Coordinating Agency under the Australian Government Crisis Management Framework. States, territories, the private sector or civil society may request that an NCM is activated for a specific purpose/issue. Requests will be considered by NEMA in consultation with relevant Australian Government stakeholders.

Australian Government capabilities such as the National Joint Common Operating Picture (NJCOP), the Australian Government National Situation Room (NSR), the Australian Government Joint Crisis Coordination Team (CCT) and the Crisis Appreciation and Strategic Planning (CASP) methodology support the NCM by enabling strategic planning, near real-time situational awareness and other coordination functions.

Where appropriate, the chair(s) of the NCM may be co-opted to the National Security Committee to provide briefings on matters related to crisis coordination and response. They will also support rapid briefing of relevant Ministers.



630+ NCMs since March 2020, including:

- COVID-19 consequence management
- Food and grocery supply chain
- Diesel exhaust fluid supply
- Higher risk weather season preparedness
- Severe weather crisis response
- Freight network outages
- National supply chains
- Domestic responses to offshore conflict
- Cyber security incidents
- Critical infrastructure disruptions
- Biosecurity consequence management
- Space weather

For more information contact
national.coordination.mechanism@nema.gov.au

PIVOT FROM PANDEMIC TO MULTI-AGENCY PUBLIC INFORMATION OFFICER TRAINING

The COVID19 pandemic changed the world and led to an evaluation of the public information and warnings capability of South Australian response and support agencies.

Image credit: SA State Emergency Service

2019

Consistency of understanding

The COVID19 pandemic showed the need to have a coordinated public information response in South Australia, with the ability to mobilise government resources into different agencies to support emergency response. It also highlighted the inconsistency of emergency messaging across the different response agencies, and the deficiency of trained Public Information Officers across the South Australian Emergency Management Sector.

2021

Application for funding

In June 2021, South Australia Police received funding from federal and state governments to partner with the South Australian Country Fire Service to develop a nationally recognised,
Public Information Officer: Multi-Agency Training Program.

2023

Training development and delivery

Designed to enhance the State Government's capability across multiple response agencies, the program includes an introduction to the **Australian Warning System** and practices aligned with the **Australian Institute for Disaster Resilience's Public Information Handbook**. Beginning with an online study component which includes assessing own agency policies, procedures and practices, participants then attend a face-to-face course. This is delivered over three consecutive days and guided by experienced Public Information Officers. Case studies and discussions span across a range of incident types, including fire, flood, biosecurity, policing and human health.

Designed to teach the theory of public information and assess participants' skills in a simulated, escalating scenario of an emergency, in an incident management environment. Participants receive briefings and other injects throughout the course in which the Public Information Officer is required to react. These exercises are used to evaluate participants' decision-making abilities, practical application of skills and identify areas for improvement.

2024

Outcomes

- Promote a shared responsibility and understanding of disaster resilience.
- Give Public Information Officers the skill and knowledge to be able to confidently provide the community with clear, concise, timely and accurate information disseminated through a range of communication channels.
- Foster new partnerships and strategic networks across the emergency management sector and wider government.
- Deliver principles of *South Australia's Emergency Communications and Engagement Framework*.

Participating agencies

Attorney-General's Department | Australian Bureau of Meteorology | Department for Environment and Water
Department for Education | Department of Primary Industries and Regions SA | Department of the Premier and Cabinet
SA Health | SA Country Fire Service | SA Metropolitan Fire Service | SA Fire and Emergency Services Commission
SA Police | SA State Emergency Service

For more information contact:
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Government of South Australia
South Australian Fire and Emergency Services Commission

CFS

SOUTH AUSTRALIA POLICE
SAFER COMMUNITIES

FIRE-FLOW CAPACITY MAPPING

CONTEXT

Fire and Rescue New South Wales (FRNSW) has mapped the water pressure and flow available for firefighting (fire-flow capacity) at some of the street hydrants within the service areas of the two largest water utilities in NSW.

This data helps improve operational awareness and pre-incident planning as well as strategic investments in infrastructure renewal.

INCREASES IN POPULATION DENSITY

Changes in land zoning have resulted in higher density development in areas with water infrastructure that was only designed for low density development, as in the street shown in Figure 3.

Water mains have a design life of 100 years and are generally not upgraded due to rezoning. As customer demand increases, the spare capacity available for firefighting is reduced (Figure 2). In the street depicted in Figure 3, the water main is DN100. However, if development of this density was built in a new suburb, the water main for this street would be DN150, which has a cross-sectional area 2.25 times greater.

Figure 3: A comparison of development within a residential street in 2009 (bottom) and 2021 (top). (Google Maps 2024)

FIREFIGHTING WATER SUPPLY

The Water Supply Code of Australia (WSA) details water network design requirements and lists minimum pipe sizes based on land zoning. These minimum pipe sizes factor in spare capacity for basic firefighting. However, water utilities aren't required to maintain fire-flows, and factors such as the cement-lining in-situ of aging water mains and increases in population density have impacted the spare capacity for firefighting in some areas.

Figure 2: Indicative figure comparing the spare capacity available for firefighting between low-density residential and high-density residential demand for a DN100 water main.

CEMENT-LINED IN-SITU MAINS

In the mid-20th century, many water mains were cement-lined in-situ to address water quality issues, reducing the diameter of the main and the spare capacity for firefighting (Figure 1). In some sections of pipe, localised blockages have been identified by the water utilities where the effective pipe diameter was as little as a few centimetres.

Figure 1: photograph of a cement lined in-situ pipe

IPART

FRNSW has made several submissions to the Independent Pricing and Regulatory Tribunal (IPART), the regulator of water utilities in NSW. Discussions with IPART and other stakeholders led to the establishment of Memorandums of Understanding (MOUs) between FRNSW and NSW's two largest water utilities. The purpose of these MOU's included information sharing.

MAPPING

FRNSW has been provided with some fire-flow and pressure data through the MOU with NSW's two largest water utilities. Some of this data has been mapped as shown in Figure 4. Hydrant performance has been categorised as follows: Less than 6 L/s (red), 6L/s to 12 L/s (yellow), 12L/s to 20 L/s (green) and greater than 20L/s (blue). All flowrates are at 150kPa.

Figure 4: Fire hydrant performance mapping.

This data is extremely useful for two reasons. Firstly, it allows FRNSW to identify areas of low fire-flow in advance and plan appropriately. This may mean increasing the level of response, sending a bulk tanker, establishing a water relay, etc. Secondly, FRNSW has been able to work with the water utilities to upgrade areas of concern where it is economic to do so. Prior to this information being available, strategic decision making was difficult.

ENGAGED TO PROTECT
ENGAGED TO DEFEND

The Department of Defence is one of the largest landholders in Australia, responsible for over 2.8 million ha of ecologically and culturally diverse landscapes. Ventia supports Defence with the bushfire planning and mitigation across Victoria, Tasmania, Western Australia and the Northern Territory. Adopting a strategic and considered approach to its operations, we prioritise the preservation of land functionality for ADF training while safeguarding environmental values. Ventia effectively works with a wide range of stakeholders to design and execute programs on Defence Land that ultimately contributes to community-wide protection.

Plan

Planning is constantly reviewed for relevance against operational needs, emerging risk and climatic conditions which enhances our adaptability to any changes, promoting a heightened risk awareness and proactive management for Defence

Engage

Active and regular engagement with stakeholders through strategically focused workshops tailored to the region of delivery and at key milestones to drive more meaningful engagement through an alignment of objectives

Mechanical Mitigation

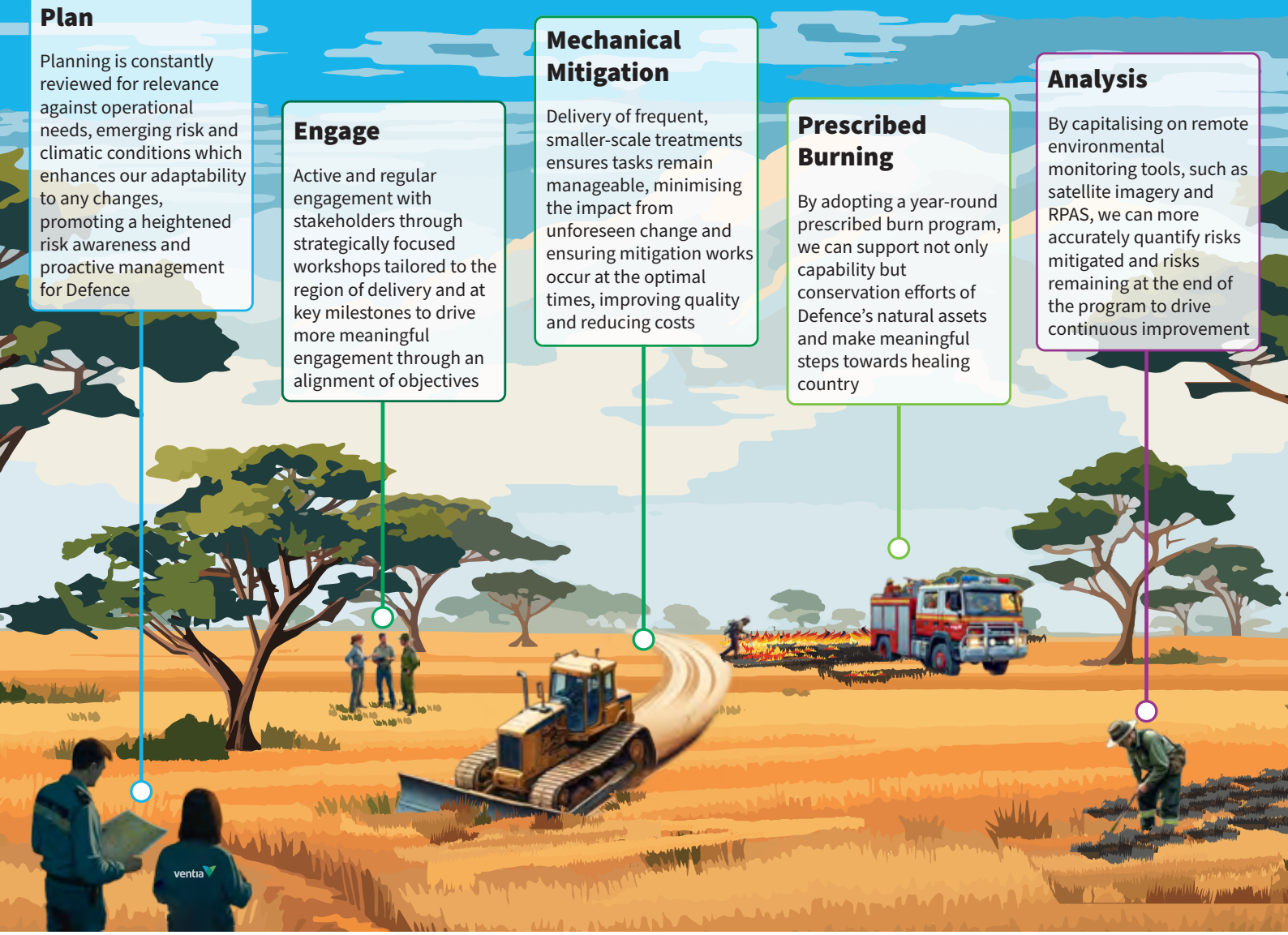
Delivery of frequent, smaller-scale treatments ensures tasks remain manageable, minimising the impact from unforeseen change and ensuring mitigation works occur at the optimal times, improving quality and reducing costs

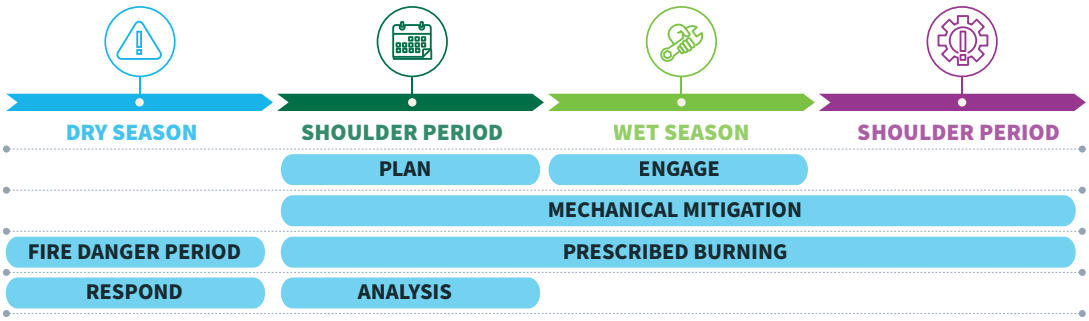
Prescribed Burning

By adopting a year-round prescribed burn program, we can support not only capability but conservation efforts of Defence's natural assets and make meaningful steps towards healing country

Analysis

By capitalising on remote environmental monitoring tools, such as satellite imagery and RPAS, we can more accurately quantify risks mitigated and risks remaining at the end of the program to drive continuous improvement





Our mitigation preparedness schedule is a cyclic process where the outcomes of one program feeds into the development of the next.

This results in annual improvements to Estate preparedness for the next fire danger period and ensures long term health of the landscape.

2,800,000+
Hectares of diverse and significant landscape

Upto **700** training activities performed annually on some Training Areas

1,100+
bushfire mitigation tasks delivered annually to maintain capability and landscape health

100+
Prescribed burns delivered annually, varying in size from 2 to 200,000 hectares

ventia SERVING DEFENCE
Driving transformation through service excellence and digital enablement

CoW & VaaN Projects

Cell on Wheels (CoW) Gen 2 and Vehicle as a Node (VaaN) embrace innovation and technology systems to maximise emergency response capability and efficiency.

Over the past three years, NSW SES members have responded to increased flood and other operations around the state.

However, operations do not necessarily happen where there is infrastructure to provide radio network coverage.

Providing members and staff the ability to communicate is paramount for coordinating operations and ensuring the safety of those responding.

To provide this critical communications capability, the NSW SES has developed the deployable Cell on Wheels asset and successfully integrated multiple technologies into a unified platform to develop the Vehicle as a Node (VaaN) technology.

Both solutions increase access to the Public Safety Network (PSN) and enhance interoperability with partner agencies during operations.

Cell on Wheels (CoW)

- Developed since 2017
- Whole-of-government asset
- Supports whole-of-government interoperability requirements
- Self-contained, self-powered Public Safety Network Cell (communications cabinet) and generator pod
- Provides rapid tactical restoration of PSN radio communications where existing infrastructure is damaged due to emergency natural disasters.
- Provides communications ability for incident response and emergency service personnel
- Increases PSN radio network capacity during major incidents.

Vehicle as a Node (VaaN)

- In-vehicle radio solution
- Provides NSW SES with multiple methods of accessing the Public Safety Network (PSN)
- Installed in all NSW SES vehicles
- Increases the safety of our members
- Ensures continuous critical communications in and out of PSN coverage areas in NSW
- Automatically switches between PSN, 3G/4G networks & satellite to provide seamless communications
- Provides all users with the same experience and access to help when needed
- Provides a platform to make quicker operation decisions
- Improved member safety from real-time vehicle tracking across the state, especially areas outside of GRN coverage

"While the Cell on Wheels will undoubtedly assist our members during emergency situations, they can also be utilised by our partner agencies as needed to support the safety of emergency services workers across the state."
- NSW SES Deputy Comissioner, Daniel Austin

"Having VaaN-equipped vehicles across the whole fleet with satellite connectivity now allows us to maintain communications which is critical for the safety of both SES volunteers and the community we are there to assist with."
- Local Commander Blue Mountains Cluster John Hughes

Since 2021, these assets have been deployed in multiple NSW SES operations, as well as in support of partnering agencies by NSW SES Volunteers. These two projects increase the ability for NSW SES to make informed decisions when operational through the transfer of data from field to command and back.

These programs have been vital in enabling our SES members to respond appropriately during emergency operations, such as the deployment of CoW's during the critical operation of Eugowra in November of 2022.

At the request of the NSW Telco Authority, a NSW SES CoW was pre-positioned then deployed via helicopter lift to a site that was isolated by floodwater, providing radio network coverage during rapid flood response.

The VaaN technology has been invaluable for road crash responders in the far west of NSW, enabling them to communicate and liaise with the State Operations Centre to relay messages to other agencies and coordinate further help where needed in areas that previously had no communications network.

Developing Trainers:

Building a Skilled and Agile Workforce for the Future

Public service delivery is constantly evolving, with emergency organisations managing uncertain and complex challenges. To stay ahead, public service organisations must invest in developing and retaining trainers who can cultivate modern skills within their workforce.

Retention is 34% higher among employees who have opportunities for professional development.

If a company invests in employees' careers, 94% said they would stay at the company longer.

The youngest generation of employees, ages 18-34, say that upward career mobility and opportunities to learn new skills are top factors when considering a new job.

Good quality training has a significant impact on volunteer retention. According to Volunteering Queensland survey reports, Induction and orientation programs was cited as one of the top four key motivational factors associated with volunteer retention.

Employees who have access to professional development are 15% more engaged.

Gallup names development opportunities as one of the five main drivers of employee engagement.

80% of workers say the chance to learn new skills would increase their engagement levels.

Sources: https://learning.linkedin.com/resources/workplace-learning-report
https://volunteeringqld.org.au/state-of-volunteering-in-queensland/

Queensland Government

Unit Classifications and Capability Reporting

"The right things in the right place at the right time to support the right people to make the right decisions"

NSW STATE EMERGENCY SERVICE

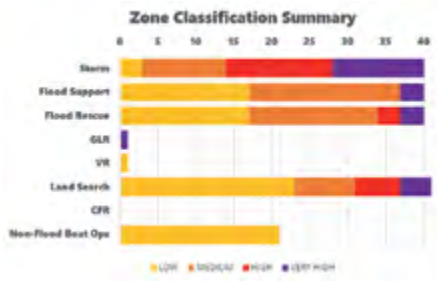
The Problem: Gaps in understanding and consistency of approach to planning and prioritising resources required to effectively deliver operational activities.

The Mission: Develop a new, data-driven way of grouping units to better understand what they need to do, their load, and therefore resourcing.

Unit Classification

UNIT NAME	
STORM	LOW
FLOOD RESCUE	HIGH
FLOOD SUPPORT	MEDIUM
GENERAL LAND RESCUE	VERY HIGH
VERTICAL RESCUE	LOW
LAND SEARCH	MEDIUM
COMMUNITY FIRST RESPONDER	Not Active
NON-FLOOD BOAT OPERATIONS	LOW

Creating a holistic view of units in terms of the the type and load of field capabilities they deliver - each unit is described using one of 5 grades (Not Active to Very High) across 8 core field capabilities. Individual algorithms were defined for each capability using analysis of historic response activity, overlaid with operational structures, availability trends and load analysis.



Challenges

- Use of historic data - completeness, accuracy, content
- Effectively combining activity data with operational rules and volunteer capacity to develop logical, consistent and widely applicable categorisation
- Engagement and alignment of volunteer voices, Zone leadership and State teams

Operator Targets

Two types of unit-level targets support consistent planning approaches for recruitment and training based on the operational functions of each unit. There are 11 core field operator roles with baseline targets and 9 operator roles with optimal targets.

Baseline Targets are the defined number of operators identified for a unit to provide a specific capability service to a community. They are the same across every unit and so do not account for load or demand variations. The key drivers for these have been safety, legislation, general member availability and good practice.

Operator Role: General Land Rescue Operator		
	Unit Classification	Operator Target
Baseline	All	6
Optimal	Not Active	0
	Low	6-8
	Medium	8-12
	High	12-16
	Very High	16-20

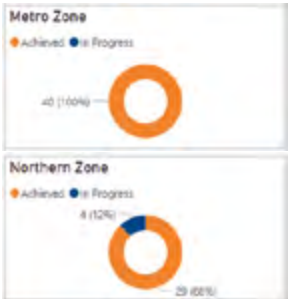
Optimal Targets identify the number of operators to effectively service a unit's local community. They vary by unit and reflect the differing volumes and frequency of each capability role. The calculations consider average member availability and take into account repeated or long periods of response requirements, so undue demands are not placed on the volunteer workforce.

Capability Reporting

An array of Power BI Reports display the data-driven approach in accessible formats

Individual member data on training and competencies:

- current and expired operator skillsets
- gap analysis
- skillset matrix displaying distribution
- identification of members for deployment
- fleet/skillset matching to aid resource alignment



Target comparison:

- unit-based target reporting to enable localised planning
- Zone and State target comparison and shortfall reporting by each capability area
- holistic whole of unit target attainment
- identification of surge capacity and deployment asset location

Outcomes & Benefits

- NSW SES is better able to define and address critical areas of member and skillset need
- Common language, clarity and doctrine around capability and associated data across the Agency
- Standardised and holistic understanding of unit roles and activity levels across a range of capability areas
- A comprehensive and consistent target-based training needs analysis is possible from Unit to State level
- Classification and targets can be utilised for resource planning across areas such as Facilities, Fleet, Equipment
- Insights and improvements to current data collection and reporting

This work sets a new baseline, with significant opportunity for development to further enhance our planning and delivery capabilities.

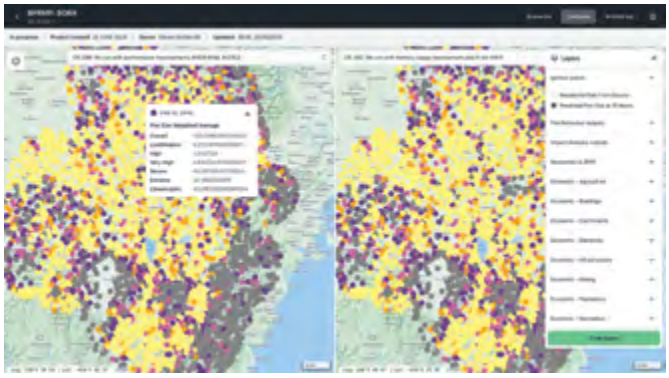
RFS

Rapid Response: A Lightspeed Approach to Bush Fire Risk Planning

Author/s: Simon Heemstra, Melissa O'Halloran and Thomas Hart

THE CHALLENGE

Bush Fire Risk Management Plans (BFRMPs) are crucial for fire agencies, guiding strategic priorities, resource allocation, risk mitigation, and community safety. With climate change causing increasingly erratic behaviour and a higher frequency of natural disasters, along with Australia's urban sprawl, these plans must be more dynamic and adaptable. Existing methods are time-consuming and can't keep pace with rapidly changing conditions or the increasing responsibilities of the NSW Rural Fire Service (RFS).



Risk Modelling Platform - Current Risk Scenario Geospatial Outputs

THE APPROACH

To address these challenges, the RFS, in collaboration with the NSW National Parks and Wildlife Service and Kablamo, developed the Risk Modelling Platform (RMP) funded under the NSW Government. Success stemmed from a commitment to collaborative design and user-centric development. Through workshops, interviews, user working groups, and participation in District Bush Fire Management Committees, the team gained insights to streamline and future-proof methodologies. An iterative development approach, with two-week feature development cycles and continuous stakeholder engagement, ensured the platform met the needs of its end-users.

OUTCOMES

This world-first, all-in-one platform automates data processing and reduces model run times from months to hours. The RMP enables users to query, edit, and run thousands of fire simulation permutations to generate risk products or test hypothetical scenarios in a cloud environment at an unprecedented scale. This capability provides flexibility and responsiveness, putting bush fire risk planning into the hands of local brigades, their communities, and Traditional Custodians.

FUTURE DEVELOPMENT

The RMP offers numerous opportunities for further development and integration. By leveraging the RFS' existing technological investments, like Athena and Guardian, the RMP enhances the RFS' capabilities, creating a cohesive risk management ecosystem. Feature development set to be completed by year-end includes:

- **Individual Treatment Comparison:** Facilitates comparison of mitigation options for bushfire risk management, aiding in risk prioritisation and smoke modelling.
- **State-wide Risk Products:** Supports creation of state-wide risk products, rerun annually to account for completed fuel treatments, with potential to incorporate climate-projected scenarios.
- **Localised Risk Products:** Enables development of event-specific or local case studies, including modelled impact time, enhancing land use planning and disaster preparedness.
- **Sandbox Environment:** Allows users to access a sandbox environment for unstructured projects, testing, and experimentation.

KABLAMO NSW GOVERNMENT

From Crisis to Collaboration: NSW DPIRD's Two-Decade Odyssey in Emergency Response

Jo Loughlin[1], Steve Eastwood[1], Leigh J. Pilkington[1*]

[1]NSW Department of Primary Industries and Regional Development, Biosecurity and Food Safety
[*]leigh.pilkington@dpi.nsw.gov.au

FLAIM

Training for a better tomorrow

Creating a Safer & Smarter Future in Firefighting with Immersive Learning

Immersive learning, leveraging advanced technologies like virtual reality (VR), is transforming firefighter training, enhancing situational awareness, and improving skills acquisition and maintenance to complement live fire training. These technologies are providing a safe and controlled environment where a trainee can practice to build the muscle memory needed to respond safely and effectively.

What is immersive learning?

Immersive learning is a teaching strategy that uses technology to imitate real-world locations and scenarios, increasing the learning experience by engaging multiple senses and incorporating interactive features. Immersive learning is comprised on the following essential technologies:

Why immersive learning?

With immersive learning trainees are:

4x
Faster to train than the classroom & more focused then their e-Learning peers

275%
More confident to apply skills learned after training

3.75x
More emotionally connected to content than classroom

Virtual reality (VR)

A fully immersive 3D environment where trainees can interact with the digital world as if they were physically present.

Augmented reality (AR)

Overlaying digital information onto the real world and improving it with interactive components.

Mixed reality

Combining the physical and digital worlds and enabling interaction between actual and virtual items.

Simulations

Software that mimics real-world processes or systems for learning purposes, frequently incorporating components of VR and AR.

Haptic feedback

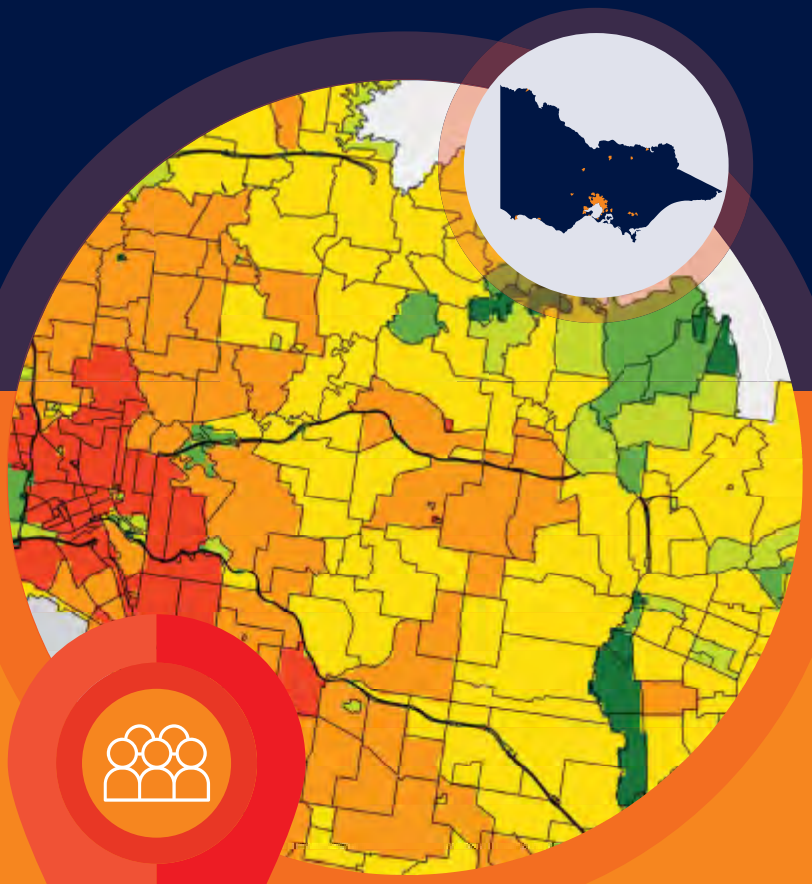
Using tactile sensations to imitate the sense of touch, providing a physical component to the learning experience.

Learn more

flaimsystems.com

FRV's risk-based approach to service demand planning

Understanding the needs to the community we serve and how FRV can best align its capabilities to meet service demand.



Relevant risk drivers for each capability are mapped to see how the risk differs across the communities we serve.

Data-informed community risk assessment provides insights to help protect the community and maximise firefighter safety.

The impact of the changing environment is modelled to understand future risk and therefore inform future planning.

Risk drivers for urban fire suppression*

*Each response type has its own set of risk-drivers.

- Historic incidents
- Estimated smoking density
- Dwelling density
- Vulnerable age density
- Population density
- Socio-economics
- Combustible cladding density
- Industrial building density

Capability inputs for urban fire suppression

- First appliance arrival
- Second appliance arrival
- Station coverage

Having mapped the drivers of risk, existing capability is overlayed spatially, to understand residual risk.

This informs priority-setting and decision-making about future service and capability planning, and service delivery models, which ultimately results in safer and more resilient communities.

To find out more about FRVs risk-based approach please contact accreditation@frv.vic.gov.au

FIRE + RESCUE

DRILL NIGHT LIVE - LEARNING TOGETHER
HIGH QUALITY, TARGETED AND ENGAGING ONLINE TRAINING FOR ALL STAFF

BACKGROUND

Drill Night Live (DNL) is a unique and relevant training program. It is consistent in its quality and has benefits to all FRNSW staff – both uniform and non-uniform. Each episode is a broadcast quality, one hour presentation on various firefighting subjects, utilising organisational subject matter experts. There is a live panel mixed with pre-recorded segments, and the format allows employees around the state to ask questions live, as well as participate in quizzes.

So far DNL has seen eight (8) online lessons that have been live streamed to on and off-shift crews, plus administration and trades staff.

The information is presented in a credible, understandable, inspiring and memorable style. The intention is to build interest in a more in-depth knowledge of organisational doctrine.

Many features of DNL presentations were born of the e-learning methodologies developed during the COVID-19 lockdowns and periods of isolation. The benefit is a program that complements all existing educational strategies and generates a sense of inclusion across the entire organisation.

RESULTS

DNL has received high levels of support from across the organisation and has excellent engagement rates.

Each lesson varies in viewer numbers, based on interest and engagement. The most watched lesson was Drill Night Live 5 - Mega Structure Fires with 3,768 unique views, combining live views and repeat viewings.

FOLLOW THE QR CODE ABOVE TO SEE HIGHLIGHTS FROM PREVIOUS LESSONS.

NSW GOVERNMENT

Nurturing diversity and inclusion for volunteer sustainability

Volunteer Sustainability Strategy 2023—2026

'A Vital Future' Action Plan

Inclusivity means creating a space where every person feels appreciated, respected and included no matter their differences. It involves actively removing barriers and ensuring equal opportunities for everyone.

Diversity refers to the variety of individual differences, including gender, age, ethnicity, disability and sexual orientation. Inclusivity focuses on building a welcoming environment, while diversity highlights the importance of recognising and celebrating these differences.

Together, inclusivity and diversity are essential for fostering a sense of belonging and building a community that embraces all individuals.

It is essential, too, to emergency services volunteering for reasons including:

- Variety of perspectives leads to better decision making.
- Inclusivity fosters effective communication and collaboration.
- Better reflects the community it serves.
- Brings vital cultural insights and language skills to the team.
- Wider range of volunteers enhances recruitment efforts and reduces turnover.
- Diverse teams are more adaptable and resilient.

Volunteers

26,606

49 Average Age

♂ 76% Men

♀ 24% Women

28.6% of women and 24.7% of men had done volunteer work in the previous 12 months to April 2022.

Male volunteers aged 65 or more years were the most likely to volunteer (34.3%). Female volunteers aged 30-49 years were the most likely to volunteer (39.0%)[3].

The Department of Fire and Emergency Services WA Volunteer Sustainability Strategy 2023-2026 'A Vital Future' was developed after two years of consultation with emergency services volunteers, staff and support networks.

Its aim is to ensure sustainability of our emergency services volunteers who provide a vital service to the Western Australian community, by addressing barriers to recruitment and retention, increasing access to relevant training for volunteers, fostering connections with local governments and promoting effective relations between volunteers, staff and stakeholders.

Diversity and inclusion are key aspects of the Strategy which is reflective of the Department of Fire and Emergency Services (DFES) Corporate Strategy 2020-24 which includes a focus on:

- working with communities,
- nurturing a culture of diverse and capable people, and
- the delivery of effective and expert emergency management.

DFES recognises the importance of a diverse and inclusive emergency services volunteer workforce. A number of key actions will support volunteers, maintain a sustainable volunteer workforce in rural and remote areas and help DFES foster new ways of thinking - to ensure it is prepared for the challenges faced now and into the future.

In line with empirical research[1] which has informed frameworks for diversity and inclusion, a number of actions have been developed which support inclusivity of people from different genders, age groups[2] and backgrounds.

Actions we're taking

- **Provide information on reducing risk in a disaster to Culturally and Linguistically Diverse communities and support their connection with emergency services volunteers.**
- **Provide annual comparison of demographic data (volunteers with community) to inform recruitment planning.**
- **Increase awareness of the importance of reflecting volunteer diversity in images to promote and celebrate diversity and inclusion across DFES.**
- **DFES business areas with an online presence to work toward, achieve or maintain digital accessibility accreditation.**
- **Support the continued development of youth programs statewide and encourage young people to transition to adult volunteering.**
- **Provide training to volunteer groups that supports the attraction of people from diverse backgrounds.**
- **Celebrate Youth in Emergency Services Awards events.**
- **Promote nominations for volunteering industry awards with an emphasis on diversity and inclusion.**
- **Develop, sustain and strengthen relationships with First Nations volunteers and community members.**
- **Develop and promote new recruitment and retention resources which support diversity and inclusion.**
- **Develop and disseminate volunteer data dashboards which detail recruitment and retention trends by region, service and demographics.**

[1]Young, C., Jones, R., McDonald, F. & Rasmussen, B. Diversity and inclusion: building strength and capability – final project report. (Bushfire and Natural Hazards CRC, 2021).

[2]McDonald, F. Young people and the emergency services: working towards inclusive partnerships. (Bushfire and Natural Hazards CRC, 2021).

[3]Volunteering Australia. Key Volunteering Statistics. March 2024. Volunteering-Australia-Key-Volunteering-Statistics-2024-Update.pdf (volunteeringaustralia.org)

For more information, contact Dr Catharine Phillips, Manager Strategic Volunteer and Youth Programs

M: 0476 897 856
E: catharine.phillips@dfes.wa.gov.au

dfes.wa.gov.au

Firefighting ecosystem ambition by Airbus

Integrated, multi-asset approach for missions success - making the world a safer place

Sensor inputs

Day & Night Video

Voice communication

Geo information/ geo tracking

Open source info

Satellite imagery

Analytics
Real time C3 (Command, Control & Coordination)

Data Fusion

Cloud based

Secure Remote Access

SATELLITES

- Satcom/connectivity
- Earth observation for risk assessment, situational and damage assessment
- Fire detection

UAV

- Fire detection
- Surveillance
- Connectivity

FIXED WING

- Surveillance/ connectivity
- Logistic
- Transport/medevac
- Firefighting

GROUND SYSTEMS

- Secured communications, connectivity
- Command & control and coordination
- Real time situational awareness/tracking

HELICOPTERS

- Firefighting
- Search & Rescue
- Aerial Command & Control
- Connectivity
- Medical evacuation
- Rescuers transportation
- Heavy Equipment airlift

AIRBUS

Firefighting

Helicopters make the difference by assisting first responders whatever the task. Supporting the fight around the clock - in all types of terrain and in all types of weather, day and night.

H125

THE FIRST ON THE SCENE

Battles blazes at the earliest opportunity and means nowhere is out of reach for firefighters.

4 firefighters

Belly tank 1,200 litres

Water bucket 1,200 litres

Delivering up to 25,000 litres of water in 2h 30min of flight

H145

BORN TO SAVE LIVES

Saving lives whilst battling flames, day and night with an extensive array of equipments.

Unrivalled power margin

Electrical hoist

Latest generation of avionics

Large cabin

Water bucket 1,200 litres

Belly tank 1,000 litres

H215

HEAVY SUPPORT FOR FIRST RESPONDERS

The helicopter's excellent payload allows it to transport as many as 20 firefighters and its rugged design means it can handle the most challenging conditions.

Optimal firefighting day and night

New-generation cockpit

Belly tank 4,000 litres

4,000 litres in water bucket

96,000 litres in 2h operation / 24 rotations

H225

THE DISASTER RELIEF GUARDIAN ANGEL

Tailored to rescue firefighters in the most extreme conditions, it also makes the difference with powerful and precise water bombing.

Transports up to 22 firefighters

Water bucket up to 4,500 litres

Belly tank 4,000 litres

AIRBUS

ENABLING THRIVING NETWORKS

Networks have existed at Fire and Emergency New Zealand for years but the organisation had never formally committed to this important mahi (work) – until now. In recognition of the critical role Employee Led Networks (ELNs) play in supporting our people to feel included, valued and that they can be themselves as they go about their mahi, we have committed to funding our ELNs.

In September 2023, we published new guidelines for our current and emerging ELNs. The guidelines outline how Fire and Emergency supports our ELNs, how they align with our strategic objectives and the process for establishing a new Network. Our Networks all contributed to the development of these guidelines to ensure the document reflected the individual needs of each Network. The guidelines formalises the role of our Chief Executive and wider Leadership Team in supporting our Networks and ensuring their long-term sustainability.

Along with the guidelines, funding for our ELNs was established for the first time. Existing Networks now receive $10,000 each, per year, and can bid for more pūtea (money) if required. This funding is pooled from each branch to emphasise the importance of cross-organisation collaboration.

Kia Toipoto Programme
The funding and the guidelines are part of the work of our Kia Toipoto programme. The programme encourages diversity and inclusion at Fire and Emergency and aims to remove bias and discrimination from all phases of the employee and volunteer lifecycles.

"GUIDELINES FOR ELNS AND FUNDING HAVE BOTH RECENTLY BEEN ESTABLISHED FOR THE FIRST TIME. EXISTING ELNS NOW RECEIVE $10,000 EACH, PER YEAR, AND CAN BID FOR MORE PŪTEA IF REQUIRED.

Each Network decides how they spend this funding, depending on what is most important for them. Since the funding was released, each Network has approached this differently:

Afi Pasefika
Celebrated their 20 year anniversary and leadership fono (meeting), with the Secretary for Pacific Peoples in attendance.

Neurodiversity - Kanorau Ā-roro
Our newest Network, the Neurodiversity Network, held a successful launch with a video and a range of inspiring guest speakers.

Fire and Emergency Disability Network
Came together for an in-person hui (meeting) which catered to various accessibility needs – the first time they have been able to do this!

Our Māori Network: Te Rōpū o Te Hiku and Ngā Wai o te Rā
Hosted a wānanga (meeting) at a local marae (meeting house) to uplift whanaungatanga (connections) and to plan on ways to improve Māori outcomes in our communities.

Whiria te Tāngata
Focussed on raising the visibility, inclusion and participation of Rainbow Communities through community engagement, planning workshops and education.

Women in Fire and Emergency (WFENZ)
The funding was used for wāhine (women) and pou tuarongo (allies) to organise engagement and development events that are suited to their needs and their districts.

NAOMI PEACOCK

Naomi has been with Fire and Emergency for just over 2.5 years and currently works as the Diversity Lead for the organisation. She feels at home in the Diversity space, making a difference for all of our people as they serve the diverse communities of Aotearoa New Zealand.

naomi.peacock@fireandemergency.nz

KEY OUTCOMES

The funding and the guidelines have meant our Networks are more visible throughout the organisation and ensures that they are being called on for expert advice and insights. It is exciting to see this change throughout Fire and Emergency as we move towards a more safe, inclusive and positive organisation.

Breathing easy: tackling the toxic exposure threats to wildland firefighters.

Kiam Padamsey,[1] Ruth Wallace,[1] Adelle Liebenberg[1] and Jacques Oosthuizen, [1]

[1] School of Medical Health Sciences, Edith Cowan University, Western Australia

A mixed-method investigation of the health risks to wildland firefighters in Western Australia

Four research projects uncovered numerous factors affecting wildland firefighter PPE adherence, quantified the harmful personal exposures experienced at bushfires and found that the firefighting tunic is a secondary exposure source.

Background

Bushfires have always been a part of the Australian summer. But with temperatures rising, and rainfall reducing (Perth has just recorded the driest summer in 150 years) out-of-control bushfires across the vast state are increasing in frequency and intensity. This research aimed to examine the harmful exposures that firefighters experience at bushfires through both a qualitative and quantitative lens.

Methods

First, a pilot study trialled the proposed methods and confirmed the ability of the sampling equipment to be suitable for work in a bushfire environment. After this, 23 in-depth semi-structured interviews were conducted with forestry and volunteer firefighters. Then, from April to December 2023, real-time gas and particulate exposure monitoring was conducted on n=40 participants across ten prescribed burns and bushfires across WA. From each fire event, an outer tunic was analysed for post-incidence off-gassing of toxins. In addition, the chemical and heavy metal composition of the bushfire smoke from fires burning across five distinct eco-regions of WA was analysed using a portable Fourier transform infrared spectrometer.

Findings

Firefighters need assistance

Interviews revealed that volunteer firefighters lack a basic understanding of the health risks they face when working in a bushfire environment. Forestry firefighters across WA lacked any access to P3 respiratory equipment and did not have access to showering or laundry facilities at their workplace, this caused significant concern and unrest

Masks are paramount

Personal exposure monitoring at wildland fires revealed that firefighters experience high levels of workplace exposure for short periods of time, exceeding workplace standards set in other professions. PM10 was the most abundant particle size, contrary to previous findings.

Decontamination and isolation of PPE

We found that the firefighting tunic undergoes a process of off-gassing of chemicals such as benzene, acrolein and formaldehyde (carcinogens) following exposure to a bushfire. The tunic needs to be considered a secondary exposure source to firefighters and their families and should be isolated and washed safely.

Impact

We have translated this research into real-world action.

Here is a brief rundown:

- Our research has given the scientific backing for forestry firefighters in WA to be supplied with P3 respirators. This means that over 600 firefighters will have adequate breathing protection for the first time going into the 2024 bushfire season
- We have highlighted the importance of decontamination of PPE. The provision of washing machines in fire stations across the state is now underway.
- We are investigating the effectiveness of laundering processes to best protect firefighters
- We have begun to develop methods for surrogate exposure monitoring to monitor the health risks in the future.

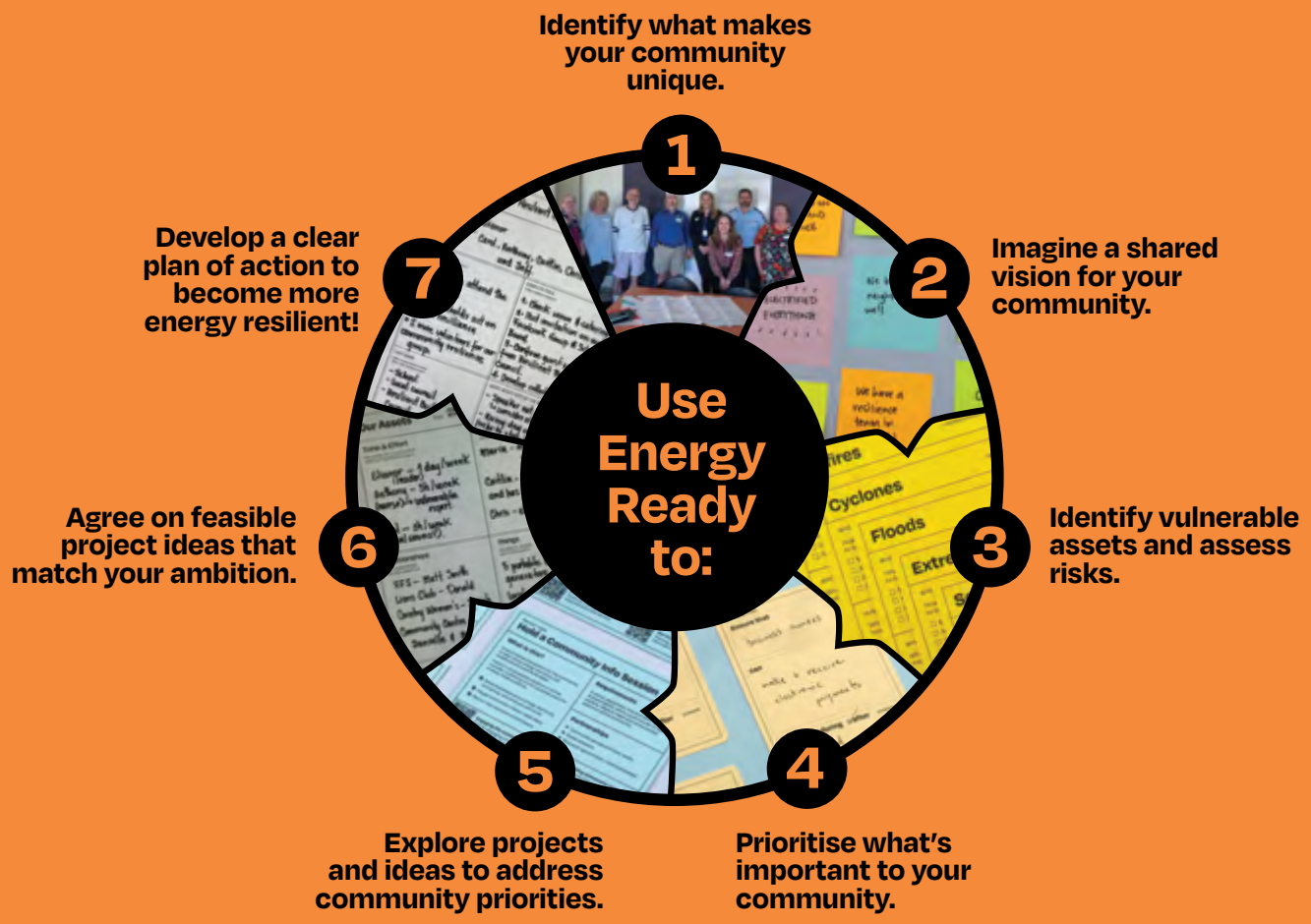
Further information

For additional information and research collaboration contact:
Kiam Padamsey, Edith Cowan University
k.padamsey@ecu.edu.au

Energy Ready is a toolkit for communities who want to become more resilient to climate change.

Energy Ready supports communities to get together and plan, so they're better prepared to meet their essential energy needs in an emergency.

Energy Ready has been developed with communities, for communities. It draws on insights from communities around Australia who have experienced and are at risk of climate-related disasters. It also draws on leading academic research and input from energy and resilience experts from around Australia.



Download, use and share Energy Ready

Acknowledgements: Energy Ready is funded by Energy Consumers Australia, researched and written by the Institute for Sustainable Futures at the University of Technology Sydney, with community engagement by Community Power Agency and design by Parallel Lines. An advisory group of cross-sector experts, stakeholders and government agencies from around Australia also contributed their expertise.

ENERGY CONSUMERS AUSTRALIA

community power agency

UTS Institute for Sustainable Futures

Parallel Lines

BURNING DOWN THE HOUSE

In August 2023 Fire and Emergency New Zealand burned a house down live on TV.

As the nation watched from the safety of their lounges, a journalist inside the property, accompanied by our firefighting teams, was able to dramatically demonstrate the dangers of lithium-ion batteries, the speed of fire, the importance of working smoke alarms and the necessity of escape plans and safe meeting places.

The decision to burn a house down on live TV in order to educate the public about fire safety was both bold and strategic. By leveraging the nation's attention during Seven Sharp, New Zealand's prime time current affairs programme, Fire and Emergency seized a unique opportunity to not only raise awareness but also get viewers talking about fire prevention and preparedness.

The meticulous planning and coordination between the Fire and Emergency and Seven Sharp teams was fundamental in ensuring the success and safety of the event.

From selecting a suitable property marked for demolition, to orchestrating the controlled burn, every detail was carefully considered to deliver impactful messaging while prioritising public safety. The collaboration extended beyond the broadcast itself, with efforts made to involve local communities, schools and kindergartens before, during and after the event. This comprehensive approach not only minimised disruption but also fostered community engagement, amplifying the reach and effectiveness of the initiative.

The response to the live house burn was overwhelmingly positive with over 700,000 New Zealanders tuning in—a testament to the effectiveness of a disruptive approach. Subsequent news coverage highlighted outcomes, such as a notable increase in households adopting fire escape plans. This positive shift in behaviour demonstrates the power of an innovative approach to public education and awareness campaigns.

> *"THE RESPONSE TO THE LIVE HOUSE BURN WAS OVERWHELMINGLY POSITIVE WITH A RECORD AUDIENCE OF OVER 700,000 NEW ZEALANDERS TUNING IN — A TESTAMENT TO THE EFFECTIVENESS OF A DISRUPTIVE APPROACH AND KEY FIRE SAFETY MESSAGING.*

KEY OUTCOMES

The live house burn event exemplifies Fire and Emergency's commitment to not only protecting communities, but to also empowering individuals with the knowledge and resources to safeguard themselves and their loved ones.

By harnessing the power of media, collaboration and innovation, Fire and Emergency continues to set new standards in fire prevention and emergency response, ensuring a safer and more resilient future for all New Zealanders.

ANNA GORDON

Anna is a Senior Advisor Community Readiness and Recovery as well as being a Volunteer Station Officer in her local community.

anna.gordon@fireandemergency.nz

CHRIS KENNEDY

Chris is the Manager Regional Training for Te Upoko and the Chief Fire Officer of the Levin Volunteer Fire Brigade.

chris.kennedy@fireandemergency.nz

CFA's journey to emission-free capability in road crash rescue vehicles

OUR COMMUNITY • OUR CFA

Introduction

As we progress towards a future with vehicles without direct vehicle emissions, we need to be confident that vehicle stowage doesn't adversely affect operational capability due to excessive power draw.

Background

CFA recently developed an emission free stowage concept, a preparatory step towards the adoption of alternatively powered vehicles.

The initial goal was to eliminate the reliance on hydrocarbons, while reducing the requirement of the vehicle to provide a power source during rescue operations.

This work included the removal of generators and fixed hydraulic infrastructure and has resulted in a range of benefits.

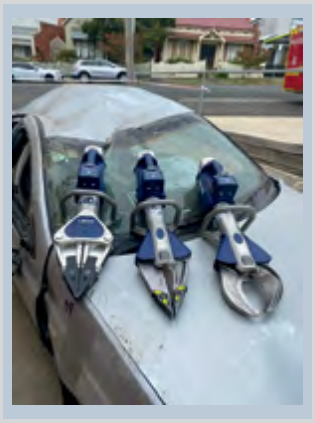
Assistant Chief Fire Officer Richard Owen AFSM

Outcomes

Direct benefits

The removal of 240-volt equipment has **removed the risk of electrocution**, while also **reducing maintenance costs** as no testing and tagging is required.

Battery-operated tools also **remove the need to access the vehicle roof for servicing purposes, reducing the risk of falls from heights.**



No longer being tethered to a vehicle by electrical cables has also meant **increased service flexibility, response speed and user safety,** while the removal of hydraulic lines means the **risk of fluid injection injuries is eliminated.**

Battery-operated tools also **eliminate the need to carry spare petrol** while **reduced noise production** benefits both the operator and patient.

Hydraulic equipment meant there was a reliance on a single supplier to ensure operational compatibility as many such tools feature incompatible couplings or hoses. The move to battery-operated tools has **reduced reliance on a single supplier and introduced supply competition and subsequent cost savings.**

Broader benefits

Battery-operated tools have decreased mass and volume compared to their predecessors, thus **reducing GVM and stowage space requirements**, results in **lower vehicle centre of gravity** and **improved handling and safety.**

Future development

Future iterations of rescue vehicles could see **smaller, safer, more agile rescue vehicles produced at reduced cost and timeframes.**

NSW STATE EMERGENCY SERVICE

What about my animals?

- **69% of Australian households have a pet ***
- **There were 24.4M cattle and 68M sheep in Australia (2021) ***
- **There are estimates of more than 1M horses in Australia ***
- **83% of the public will risk their lives to save an animal ****

During flooding events, members of the public are likely to put themselves and others at risk to try to save a domestic animal, especially if emergency services are unable to reach their pets in time.

Custodians of domestic animals can easily become overwhelmed by the sudden nature of flash flooding and riverine flooding and be unable to move their animals to a safer place in time.

Who can they call?

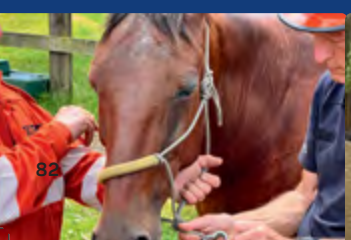
Fortunately, in NSW, the State Emergency and Rescue Management Act (1989) has included domestic animals within the definition of rescue. Custodians of domestic animals in actual or threatened danger of harm can call 000 or 132500.

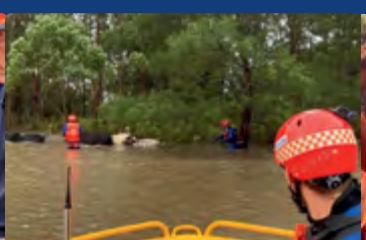
The NSW SES is continually building and enhancing its flood rescue capability and capacity, including domestic animals.

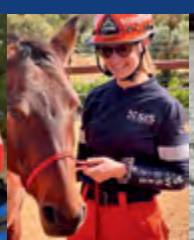
Our flood rescue operators are being trained in large animal awareness and how to safely relocate or rescue large animals from actual or threatened danger of flooding.

*Australian Institute for Disaster Resilience (2024) Planning for animals (DRAFT)

**www.bartacic.org/wp-content/uploads/2022/03/NON-NFCC-FRS-Initial-Situational-Awareness-Jim-Green-v5-WEBSITE.docx.pdf





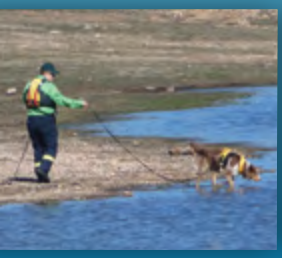
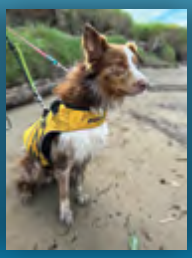


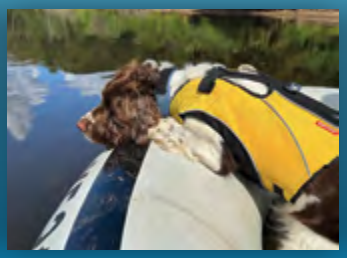
EMBARKING ON A CANINE WATER SEARCH CAPABILITY

Sue Pritchard CF
VRA Rescue NSW Search Dogs

In 2023, with the support of international multi-agency collaboration, VRA Rescue NSW Search Dogs embarked on the development of the first qualified Water Search Dog capability for Australia.

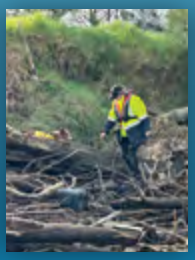
This vital capability was financed through NSW State Government Flood Enhancement funding.

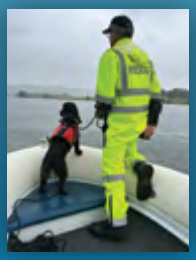




Water Search Dog teams narrow down a search area, assisting with recovery of victims from floods, or other circumstances. In doing so, they provide closure to loved ones, reduce time-related search trauma in local communities, and in flood events, allow more emergency service resources to be deployed elsewhere to save lives.

As a pioneering capability, the knowledge and operational experience provided by trainers and assessors from the UK National Search and Rescue Dog Association (NSARDA), and Virginia Search and Rescue Dog Association, and Fully Involved K9 was critical. The capability was identified for Australia through a Churchill Fellowship research study.



Scientific guidance was gratefully received by scientists from the University of Technology Sydney's Australian Facility for Taphonomic Experimental Research, and the UK Defence Science and Technology Laboratory who educated the team on human remains decomposition and identification on land and in water.

In June 2024, five Canine Water Search teams were operationally qualified to NSARDA Water Search Dog standards. An additional three teams are under development.

VRA Rescue NSW Search Dogs is very proudly sponsored by the Petbarn Foundation.

Check out our video!

For more information visit our website:
VRA Rescue NSW Search Dogs
sardogs.org.au

K9SearchRescueVRA

@k9searchrescuevra

VRA RESCUE NSW

Petbarn Foundation

NSW GOVERNMENT

Aquatic Medical/Emergency Response Training in Haikou, China – a collaborative approach

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.

Andrew Chan
Learning and Development Manager, SLSNSW

Chris O'Rorke
Commercial Aquatic & Event Services Manager, Australian Lifeguard Service (NSW) & Australian Event Safety Services

Background

With the significantly increased drowning risks in the flood affected areas, open water and aquatic environments, emergency services have started investing and building emergency response capabilities in aquatic environments.

SLSNSW in partnership with Royal Life Saving Society Queensland, Haikou 120 Medical Emergency Centre and National Foundation for Australia-China Relations delivered a specially curated Aquatic Medical/Emergency Response Training program to a group of 40 emergency doctors and fire fighters internationally in Haikou, China.

This program was delivered by a training team of ten (10) formed by accredited facilitators from Australia and Hong Kong. It covered four (4) key elements including drowning related theories risk management, search and rescue and spinal management.

Lessons learnt

The organisation and delivery of this program required a high level of collaboration from all participating organisations and individuals. The key learnings are

1. Our capability/agility in delivering a curated program internationally/key program outcomes
2. The use of artificial intelligence to assist with learning design and the creation of bilingual learning materials.
3. Our ability to identify funding opportunities and secure program funding
4. Logistical challenges/delivering training equipment overseas.
5. Delivery of reflective learning

Conclusion

With the in-house learning design capability and experience delivering programs internationally, SLSNSW is positioned to share, collaborate and learn from agencies not only nationally but also internationally.

The **key elements** are:

1. **Element 1.** Drowning: the most preventable, neglected and pressing public health issue
2. **Element 2.** Risk Management
3. **Element 3.** Search and Rescue
4. **Element 4.** Spinal management

The performance criteria

1. Conduct an effective risk assessment
2. Perform an effective search in open water
3. Perform basic water rescues
4. Retrieve a drowning patient from open water
5. Retrieve a suspected spinal injured patient from open water

SURF LIFE SAVING NEW SOUTH WALES

ROYAL LIFE SAVING QUEENSLAND

Australian Government

NATIONAL FOUNDATION FOR AUSTRALIA-CHINA RELATIONS 澳中基金会

Disaster resilience at Justice Connect

When disasters occur, existing legal problems are exacerbated, and new legal needs emerge.

About Justice Connect:

Justice Connect is an Australian legal services charity with a globally recognised digital innovation program and over 30 years' experience delivering legal services to the community.

For over a decade, Justice Connect has been responding to unmet legal need in the wake of disasters, and connecting people with free legal help when they need it most.

We build disaster resilience through:

Expert legal support

Self-help resources and tools

Digital infrastructure

- **2009**
- Service delivery and sector coordination
- **2017**
- Innovation program begins
- **2019**
- Pro Bono Portal launches
- Tailored inbound referral process
- **2020**
- Artificial intelligence project launches
- Justice Connect Answers piloted
- Self-help resource hub launches
- **2021**
- CLCs on the Portal piloted
- Disaster legal service launches
- **2022**
- AI Intake integration
- **2023**
- Disaster Legal Support Resource Hub launches
- **2024**
- Get ePrepared launches
- SmartAssist launches

Disaster Legal Support Resource Hub

When facing a legal problem, many people turn to online searches to get more information. The same is true for workers helping disaster impacted people navigate legal problems.

In October 2023, we launched Justice Connect's Disaster Legal Support Resource Hub (the Hub), a sector-first innovation in online self-help and capacity-building information sharing. The Hub hosts legal information resources for communities impacted by disasters, with a particular focus on Community Legal Centre workers and other non-legal first responders.

Visit the Hub
justiceconnect.org.au/disasters

19,365
Total views to disaster resources

77
New resources produced

39
CLCs on the Portal, across VIC & NSW

215
CLC users on the Portal

"The Portal itself is great and easy to use."
— CLC lawyer

"We love the Portal and use it all the time!"
— CLC lawyer

CLCs on the Portal

When disasters occur, communities need a swift, coordinated legal response. And as communities move into recovery, and more prolonged legal matters appear, the need for support doesn't recede.

That's why Justice Connect is contributing to building a more connected, empowered, and responsive disaster legal assistance network with our Pro Bono Portal: a technology-driven system to match unmet legal need with the capacity in our network of over 10,000 pro bono lawyers.

Learn more
justiceconnect.org.au/clc-portal

Get ePrepared

When disaster strikes, legal problems often follow.

Having documents that prove a person's identity, place of residence, or assets is a key part of many legal responses or actions available. But if these important documents are lost, damaged, or can't be found quickly after a disaster, it can add even more difficulty at an already stressful time.

Get ePrepared is a free self-help tool designed to help people learn how to store electronic copies of their important legal documents.

Visit Get ePrepared
justiceconnect.org.au/get-eprepared

82,280
Total views to Get ePrepared

DATA DRIVEN DECISION MAKING IN MINING EMERGENCY RESPONSE

Utilising Data for Informed Decision-Making in Emergency Response

CORE COMPETENCY TRAINING

National Competency Units
- Packages include PUA, RII, and HLT
- Emergency Response Certificate III (RII)
- Relevant Clinical Degree

Data Pipeline: Utilising SAP Learning Management System and Power BI visualization

CLINICAL & MEDICAL CENTRE VISITS

Visits to clinics & medical centers
- Time of day
- Work/non work related
- which are the busiest clinics? What time of day is the busiest.

Data Pipeline: Cority, Telehealth & Power BI visualization

SKILLS MAINTENANCE / RISK SCENARIO TRAINING

- Identified material risks requiring Emergency Response as a critical control.
- Connected to the Emergency response skills necessary for maintaining core competencies.
- Virtual reality training

Data Pipeline: Utilising Nintex & Power BI Visualization. Microsoft guides - HoloLens & Flame

ACTUAL EMERGENCY RESPONSE DATA

- Where/When
- Time to response
- Time on Scene
- Incident type
- Responders who attended
- Material risks involved
- Equipment used
- Skills used linked to core competencies

Data Pipeline: Nintex & Power BI visualization

SIMULATED EMERGENCY RESPONSE EXERCISES

Simulated exercises
Scenarios based on plausible events that create chronic unease
Escalation of event to trigger crisis management systems/processes

Data Pipeline: Event report (word) Keyword filters (Power Automate) Power BI visualizations

EMERGENCY RESPONSE EQUIPMENT MAINTENANCE

- Serviceability of equipment
- Purchase of new equipment
- Equipment review process
- Clinical consumables
- Vendor support

Data Pipeline: Shopify & Nintex

WHAT DATA HAS BEEN USED TO DATE:

Reducing clinical consumables at medical centers based on data to optimize inventory levels.

Improving mining production emergency response by adding vehicles, equipment, and personnel.

BHP

BMA
BHP Mitsubishi Alliance

For inquiries and additional details, please contact Andrew.White@BHP.com.

Brigade capability planning at CFA

The Baseline Capability Profiling Application (BCPA) brings together more than 60 million pieces of data from within CFA and external agencies such as the Australian Bureau of Statistics. The BCPA is a capability management tool used by CFA brigades, districts, regions and HQ to enable data-driven planning and decisions.

The BCPA presents data back to the organisation to understand current capability and the trends that are occurring over time. It is the first time the whole of CFA, from brigades to state, can see the same data aggregated to the level of approved access.

Created on the Microsoft Power BI platform, this bespoke application is available across most computers, mobiles and handheld devices that have an internet connection and a CFA member logon.

Using this platform has allowed interactivity of various data sources to a level not previously available. The data can be filtered, selected and drilled into as required by the user.

The application is supported by digital training, a CFA community of practice, an online page and a downloadable guidance booklet.

Sources of data used by the BCPA

- Australian Bureau of Statistics
- Federal Government
- Victorian Government
- esri
- A range of CFA databases

BCPA

CFA

CHALLENGES OF REMOTE AREA FIREFIGHTING - ADAPTABLE STRATEGIES AND CONSTRUCTIVE CAPABILITIES

INTRODUCTION

How does firefighting in remote areas change the strategies we implement? How do we overcome resourcing obstacles and minimal staffing restraints in extremely isolated locations?

These challenges are difficult to overcome and often push the boundaries of the standard operating procedures advocated by emergency services. Managing a large-scale incident under these conditions requires responders to navigate alternative solutions and encourages creative thinking during field operations.

In this instance, we look at how the Bindarrah Rail Incident was managed, including the pressures that were placed on our people and their responses to this incident. It is important to consider exposure limitation to ensure the effective longevity of our workforce, and the potential dangers of over-resourcing on surrounding communities.

Photo: ABC News 31 December 2023

Emergency response – Bindarrah Rail Incident

At 1050 hrs on 31 December 2023, emergency services were responded to a rail incident on a remote level crossing on the Barrier Highway at Mingary, South Australia, approximately 84kms west of Broken Hill. The incident involved a collision between a 1.8km long, 3,898-tonne freight train containing hazardous materials and the rear trailer of a 78-tonne road train.

Emergency services locations and distances from incident

Fire and Rescue NSW	Broken Hill 238 Hazmat Tanker	Broken Hill 238 Pumper		
NSW Rural Fire Service	Silverton 1 Bushfire Tanker			
SA Country Fire Service	Yunta 14 Bushfire Tanker	Peterborough 34 Pumper	Black Rock Bulk Water	
Broken Hill > 84kms away	Silverton > 100kms away	Yunta > 118kms away	Peterborough > 203kms away	Black Rock > 231kms away

The collision resulted in both locomotives and approximately 20 double stacked rail cars derailing and colliding into and on top of each other. The diesel tanks in the lead engine were ruptured in the collision/derailment and had ignited. The locomotives were reported as carrying approximately 15,000 litres of diesel fuel.

Location and resourcing restraints limited the Incident Action Plan to two tankers and one bulk water appliance on each side of the rail corridor. However, due to the distances, this would take approximately two hours to implement. Crews worked in a defensive strategy to establish cut off points to protect the exposed containers and deceased train drivers from fire and limit the expanding fire spread to the locomotive engines.

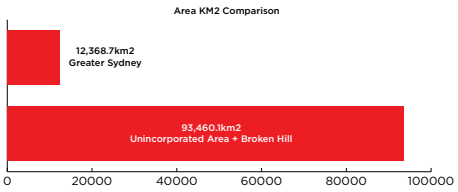
Bulk foam was supplied from both South Australia and Broken Hill and fire control gained at approximately 1745 hrs.

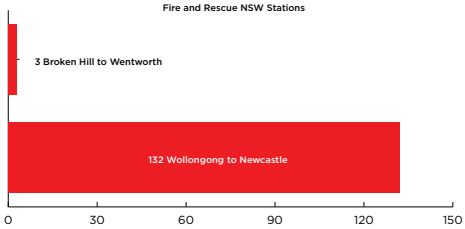
1. LOCATION AND RESOURCE DENSITY – FAR WESTERN NSW

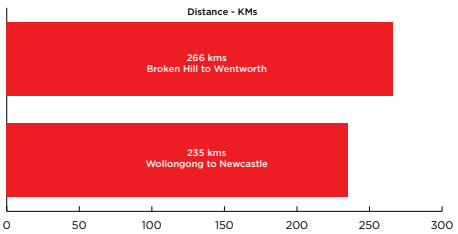
The 'Unincorporated Area' in far western NSW encompasses 93,300km2 of the state's 800,811km2 land mass. This area stretches from Tibooburra near the Queensland border, to approximately 200kms south of Broken Hill, and 100kms north of the Victorian border at Mildura.

This area includes the towns of Tibooburra, Silverton, Milparinka, and some of the land surrounding Broken Hill. With properties in the Unincorporated Area reaching up to 200,000ha, there are large expanses of land and road, where people and emergency services are over 100kms apart.

The challenges faced by emergency services in these areas vary from personnel shortages, limited departmental resources, limited water supply, communications restrictions, extreme weather and incident duration.







BARRIER HIGHWAY ROAD AND RAIL

The Barrier Highway is a 1,012km expanse of road that connects Nyngan in central west NSW to Giles Corner, north of Adelaide in South Australia.

The highway is paralleled between Broken Hill and Crystal Brook, by a rail line that passes through Broken Hill, Thackaringa, Cockburn on the NSW/SA border, Mingary, Olary, Manna Hill, Yunta, Peterborough, Jamestown, Gladstone and Crystal Brook.

Statistics from April 2024, show that on average nine freight trains pass through Broken Hill on this rail line each day.

On 31 December 2023, Pacific National train 7SP5 left Broken Hill at approximately 0919 hrs and was travelling at approximately 84kms/hr at the time of the Bindarrah Rail Incident.

With emergency services over an hour away, incidents such as this are often initially attended by local landowners and road users.

These people are often forgotten in the aftermath of major critical incidents, however, provide essential support to the public and emergency services in remote regional areas.

2. CHALLENGES AND CONSIDERATIONS

Decisions | **Impact** | **Alternatives**

With limited resources, and large distances between towns, prioritising of appliances means having to be mindful of our commitment to all surrounding communities while tasking for major incidents. This includes being mindful of coverage for fire, rescue, hazmat and medical requirements in remote areas.

HOW THIS IMPACTED TASKING

The Broken Hill 238 Captain had to choose between incident management assistance or preferred appliance type before requesting the second pumper from Broken Hill. P238 is crewed by an experienced Station Officer and Leading Firefighter while CP239 is a retained appliance, ideal for this incident but with limited incident management experience.

DECIDING FACTORS

By letting the incident progress the incident controller (IC) was able to source bulk foam from both NSW and SA. Therefore, the decision was made two hours into the incident, to respond P238 with management personnel to combat the expanding situation, rather than a specialised CAFS pumper. This extended the duration of the incident yet allowed for a more comprehensive resolution.

3. CONCLUSION

Resourcing of major emergencies in regional areas must be tactically considered based on needs and capability, rather than saturation-based approach.

Considerations of the implications of over and under resourcing are critical factors that extend far beyond the incident scene.

People are our most valuable resource. Being aware of the effects of trauma in the wake of a major incident, is vital to the care provided to our communities.

The Bindarrah Rail Incident highlighted the need for emergency services to allocate specialised resources in remote areas and use them collaboratively to ensure sufficient and timely responses to critical incidents in difficult to reach areas.

It also accentuated the potential for contracted responders and the general public to be overlooked in the aftermath of these incidents. As first responders it is our responsibility to ensure that appropriate support is provided to any person that attends a traumatic event.

References

https://jabirjamal.com/frnsw-stations/.

https://www.citypopulation.de/en/australia/admin/new_south_wales.

https://www.theaustralian.com.au/breaking-news/two-train-drivers-have-died-in-a-trucktrain-collision-on-the-sansw-border/news-story/4c29b7f171608bac8f6bc988a12e71cf.

http://www.artc.com.au.

WHEN "UNPRECEDENTED" BECOMES THE NORM

How can agencies and communities *really* be prepared?

The fires of today will be dwarfed by the fires of tomorrow.

Increasingly more frequent pyroconvection events create firestorms that prevent the use of many forms of air and ground response; our teams and our agencies are overwhelmed. We can't solve the problem by throwing more of the same at it.

Fortunately, new technologies offer completely new solutions.

The gamechanger is **synergy** — it's not one technology or approach that will create breakthroughs - it's their effective combination for a step-change in both risk reduction, and in effectiveness of agency response.

To manage the fires of tomorrow, the sequence is critical—we must deal with fire risk at landscape level, then rapidly detect and suppress.

Our team have helped bring forth new thinking and new capability at the NSW RFS, Vic CFA, ESTA, AirServices, state public safety agencies, and at a host of high-tech, industrial and government customers.

Prepare for tomorrow's fires today!

Scan to explore case studies and get in touch.

FROM HERE ON

Emergency Management
Community of Practice

Driving Continual Improvement in the Mining Industry

> Creating a unique opportunity for Western Australian mining industry and emergency response agencies to identify and share best practices and collectively improve emergency management.

The Mining Industry Emergency Management Working Group began in late 2019 to foster cooperation and improve emergency management in WA mining. It has evolved into the Emergency Management Community of Practice Incorporated which has been established in 2024.

Mining operations and response agencies need to collaborate more as mine sites expand and often share borders. Climate change is increasing the likelihood of severe events such as fires and natural disasters consequently changing risk profiles in the mining industry.

Reduced effectiveness between agencies and industry has contributed to incidents globally and in Australia. WA's mining sector sees an opportunity to enhance effectiveness through collaborative emergency management practices and technology and improve interoperability.

What do we want to achieve?

Initially involving major WA mining organisations, the group aims to expand its collaboration to include other organisations and emergency response agencies. This expansion will facilitate more information sharing and industry-wide improvement.

Members have already benefited from sharing emergency plans, engaging with response agencies and working on initiatives to standardise emergency management and response training in WA.

Our purpose

is to facilitate:

- Improving capability standards
- Technology sharing
- Research and collaboration
- Sharing lessons learned

So that we are stronger together.

Contact

Email emcofpractice@gmail.com if you or your organisation are interested in participating.

Developing Our Values, Together

FIRE RESCUE VICTORIA

Created by FRV employees for FRV

HOW DID WE ENGAGE WITH OUR PEOPLE?

Overview

Our values reflect our respective histories and guide us as we move forward together.

Our values make a lasting and positive impact on ourselves, our stakeholders and the communities we serve.

Activities

Highlights

200 **FRV leaders** came together to design activities to connect and engage with their teams.

66% **of our people** engaged in activities forming our values.

Outcomes

A set of values that guide our behaviour and decisions. Our values inform how we treat each other and the community with the respect they deserve.

The **Developing Our Values, Together** program provides our people with a cohesive set of principles that unify us with a common purpose.

We serve the Community. We value Teamwork. We have Integrity. We show Respect. We are Accountable.

81%
AGREED THEY HAD INCREASED THEIR SELF-AWARENESS THROUGH PARTICIPATING IN LEAD SELF

74%
AGREED THEY HAD DEVELOPED THEIR ABILITY TO BUILD HIGH PERFORMING TEAMS THROUGH PARTICIPATING IN LEAD TEAMS

84%
AGREED THEY HAVE LEARNED MORE ABOUT THEMSELVES AS A LEADER THROUGH PARTICIPATING IN LEAD TEAMS

RAISING THE LEADERSHIP BAR

For Fire and Emergency New Zealand to achieve its strategic goals it needs effective leadership at all levels of the organisation — leaders who are capable of building diverse and inclusive teams where people feel safe, supported and respected.

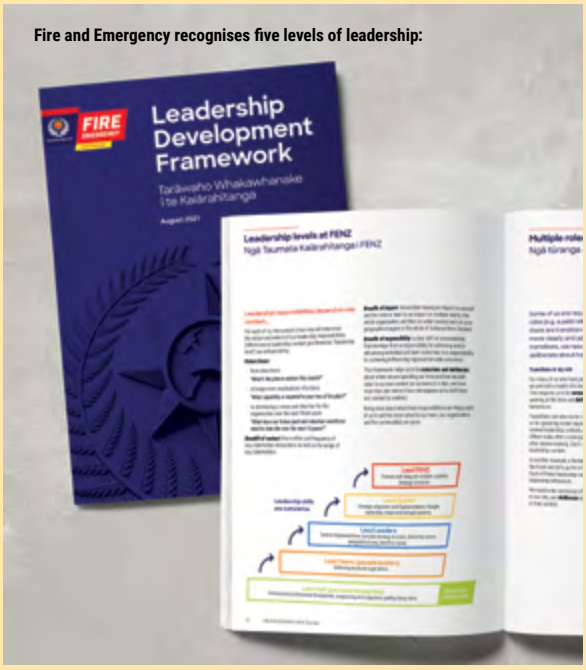
WHAT WE DID

To raise leadership capability of the organisation, we introduced a Leadership Development Framework in 2021 and we are designing and implementing leadership programmes aligned with this framework. We are equipping our leaders with the tools and skills to ensure they are focused at the right level and on the right things.

Key questions for designing our programmes:

- How do we make the development opportunities as accessible as possible? E.g. for volunteeers, for shift workers, for non-operational staff etcetera.
- How do we increase the likelihood of transfer of learning back to the workplace?
- How do we create as diverse cohorts as possible to create rich discussions that introduce participants to different perspectives?

Fire and Emergency recognises five levels of leadership:



THE INNOVATION

We have designed and implemented programmes for the first two levels of leadership.

Lead Self
We believe leadership is everyone's responsibility. The focus for Lead Self is on individuals growing their understanding of themselves and how their actions impact on others. It gives people a clearer understanding of organisational values, greater self-awareness and encourages them to be more deliberate in seeking and providing feedback.

Lead Teams
The Lead Teams programme focuses on front line leaders who we know have the greatest direct impact on the majority of our workforce. It is a blend of self-paced learning, in-person workshops, online webinars, leadership challenges to apply in the workplace, external coaching support and personality profiling as a basis for self-awareness and action. The focus is on building high performing teams and everything that supports that.

> *"I OFTEN REFLECT ON MY ACTIONS AND RECOGNISE THAT'S NOT HOW I WOULD HAVE RESPONDED/REACTED BEFORE LEAD TEAMS.*

KEY OUTCOMES

As we continue to develop our leadership programmes we are gathering evidence and insights about participants' experiences of Lead Self and Lead Teams. We are interested both in their time on the programme, and on the impacts of the programme once completed. This will be critical to developing additional programmes and improving existing offerings.

DELWYN NEILL

Delwyn Neill is the Manager of Leadership Development at Fire and Emergency and leads a passionate team who are driven to do all they can to lift the level of leadership capability across the organisation.

delwyn.neill@fireandemergency.nz

Contemporary Leadership for a Contemporary Workforce

Category: People and community – Inclusive approaches

Baby Boomers
1946 - 1964

2024	2028
17%	6%

Gen X
1965 - 1980

2024	2028
24%	24%

Millennials
1981 - 1996

2024	2028
38%	42%

Gen Z
1997 - 2012

2024	2028
16%	30%

The future contemporary workforce presents unique challenges that require leaders to possess a diverse set of skills and competencies. Research estimates that by 2028, over 40% of Australian workforce will be "Millennium Generation" - 79% of Australian CEOs recently surveyed, claim their biggest concern was how millennials' needs would change the way companies need to do business.

The Millennial generation,(GenY) has often been depicted in a negative light, General discussion of the behaviours of Millenniums include: a sense of entitlement; self-centred, requiring continuous feedback and approbation, along with a life-work balance, with agility and flexibility to work commitments. From a quick overview, one would question if this generation would suit a 24/7 immediate response sector, historically built on an "autocratic" leadership environment.

However, studies show around 40% of millennials have a university degree. This compares to around 29% of Generation X and 25% of baby boomers. Millennial women are more likely to have a degree than men of the same age, the first generation where this has been the case. They want meaningful work; Millennials want to follow their passions. They value clear communication and collaboration at work, and they often like to try out different job roles. Research demonstrates on average they will have 7 career changes and hold 22 different positions. They're also more likely to want to work for companies with good track records on issues like sustainability and climate change initiatives. Our challenge as a sector, is to build an environment where these career changes and opportunities remain within our own industry.

Research highlights that millenniums grew up with praise and approbation, regardless the achievements or outcomes. Therefore, they require constant feedback and validation. They are highly technically savvy with access to worldwide information in their pocket as a standard practice, ensuring instant gratification is achieved in all aspects of their lives. While it is impossible and impractical to identify any generation as "all the same", for the emergency services sector to maintain a contemporary workforce, these traits, behaviours and abilities require management and leadership capabilities, unseen in previous generations. Our future leaders need specific skill sets to build an environment for our emergency response sector to lead this contemporary workforce.

As a Sector we need explore the relevance and importance in building leadership capabilities that align with the needs of the future emergency services workforce.

Adaptive Leadership:

Adaptive leadership refers to the ability to transform employee and the workplace environment and engage the future workforce. Motivational and inspirational leaders must embrace change, think strategically, and drive organisational agility. Transformational Leadership concept encourage adaptive leadership outcomes. Our current leaders should encourage their teams to embrace challenges, experiment with new approaches, and learn from previous outcomes. By fostering an environment that supports adaptive thinking, leaders can guide their organisations through the ever-changing landscape of the future.

Emotional Intelligence:

Emotional intelligence (EI) is the capacity to recognise and manage emotions in oneself and others. In the future workplace, leaders with high EI are essential in building strong relationships, driving engagement, and fostering collaboration. EI is the bases of Servant leadership principles, remember, Millennials coined the phrase "I don't care how much you know, until I know how much you care" The Leaders who prioritise EI possess empathy, self-awareness, social skills, and the ability to handle stressful situations effectively.

Digital Acumen:

As technology continues to shape the future workforce, leaders must possess digital acumen. They need to understand emerging technologies, leverage data insights, and embrace digital transformation to drive innovation and competitiveness. Leaders who actively invest in their digital skills and knowledge can guide their organisations through digital disruptions and take advantage of emerging opportunities in the digital landscape.

Fostering a Culture of Innovation:

Innovation is crucial in the future contemporary workforce. Leaders need to create a culture that encourages challenging the status quos and continuous improvement. They must prioritise an open-minded approach, embrace diverse perspectives, and provide the necessary resources and support to foster innovation. Through a culture of innovation, leaders can drive growth, attract top talent to promote, and ensure organisational resilience in an evolving emergency services sector.

Diversity and Inclusion:

Inclusive leadership is essential in the future workplace. A misunderstandings of differing cultures, beliefs, and values are often the catalyst for perceived workplace "disharmony". For example, Millennials require flexibility and agility in the workplace, this is often seen by other generations as "intitled". Leaders should value and embrace diversity, fostering an environment where all individuals feel empowered, respected, and included. Inclusive leaders leverage diverse perspectives, encourage collaboration, and harness the power of diverse teams to drive innovation and creativity.

Effective Communication:

Leaders must possess effective communication skills to inspire, motivate, and align their teams around shared goals. In the future workforce, leaders need to excel in both verbal and written communication, utilising different channels and adapting their communication styles to connect with diverse audiences. Clear and transparent communication helps build trust, enhance collaboration, and drive organisational success.

Continuous Learning:

In a rapidly changing world, leaders must prioritise continuous learning to stay relevant and adapt to new challenges. They should foster a culture of lifelong learning within their organisations, encouraging employees to up-skill, re-skill, and embrace new ideas. Leaders who prioritise learning lead by example, inspire growth, and create a culture of development that ultimately strengthens their organisations' capabilities.

Conclusion:

Building leadership skills designed to meet the future contemporary workforce requires a comprehensive approach. Adaptive, transformative leadership including, emotional intelligence, digital acumen, innovation culture, diversity and inclusion, effective communication, and continuous learning are key components of leadership principles for the future workplace. These skills need to be introduced at all levels of leadership/management. By focusing on these areas, organisations and individuals can develop leadership capabilities that enable them to navigate the challenges and opportunities of the future, ensuring long-term growth, ultimately attracting, and securing both volunteer and career professionals, which after all, is the very heartbeat and future of our Sector.

Presented by QFD Inspector Dean Tucker AFSM

Exploring the role of Emotional Intelligence in Trust Building within High-Reliability Environments

Syed Adeel Akhtar[1], Assoc. Prof. Steven Curnin[1], Assoc. Prof. Benjamin Brooks[2], Dr. Darryl Stellmach[1]

[1] Disaster Resilience Group, School of Social Sciences, University of Tasmania
[2] Disaster Resilience Group, Australian Maritime College, University of Tasmania

The role of emotional intelligence and trust in high-reliability environments: A systematic literature review

Examining Emotional Intelligence (EI) in high-reliability settings, this review identifies its critical role in trust dynamics. Utilizing three databases, 15 studies were included which demonstrate EI's significant influence on trust building in certain high reliability contexts similar to disasters. Findings advocate integrating EI into recruitment and training for organizational success.

Introduction

Disaster response requires many specialised organisations to work together to tackle complicated problems. Such collaboration relies on trust to promote knowledge sharing, reciprocity, and value alignment while preventing exploitation.

Trust building involves cognitive and affective processes. Affective trust comes from connections, while cognitive trust comes from perceived competence and honesty. Even cognitive trust is affected by emotions as they alter perception, memory, and reasoning. Therefore, emotional intelligence (EI) is crucial to trust.

EI is the capacity to perceive, understand, manage, and influence emotions. EI and trust are linked in many fields, but its use in disaster response is unexplored. Since there are no studies relating EI and trust in disaster response, this systematic literature review examines similar high-reliability contexts for insights and transferrable lessons on disaster response dynamics.

Methodology

This review employed a systematic methodology guided by PRISMA guidelines, searching three primary databases to gather relevant studies.

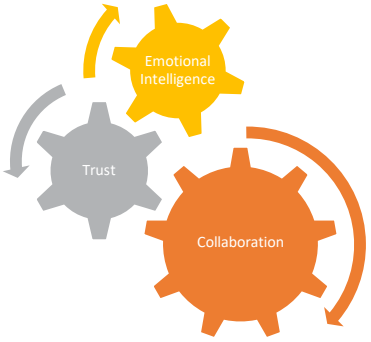
Employing three databases, Inter Rater Reliability was used for screening of titles and abstracts. The Mixed Methods Assessment Tool served for quality appraisal. From 735 initial articles, 15 studies were included, spanning diverse high-reliability contexts. A Reflexive Thematic Analysis, as outlined by Braun and Clarke (2006), was conducted on definitions of EI and trust, the impact of EI on trust, and strategies to leverage EI. NVivo was used for thematic analysis.

Findings & Discussion

EI improved trust as per the fifteen studies from selected high-reliability contexts of Healthcare, Defence, remote leadership, Not-for-profit, and project management.

EI is predominantly conceptualized as an ability, with occasional references as a trait, encompassing intrapersonal and interpersonal dimensions. EI is action-oriented serving strategic aims like trust building.

Trust is identified as a psychological state, with both cognitive and emotional underpinnings. Trust building mimics risk management when trustors' risks are identified and addressed proactively.



EI helps create and sustain trust by facilitating open communication, leadership, conflict management, impulse control, and rationalising atypical behaviours.

Structured EI training for professional development and trust building should complement EI evaluation in recruitment.

Conclusion

This review confirms Emotional Intelligence's (EI) vital role in fostering trust in high-reliability sectors. Despite limited direct research in disaster management, the correlation between EI and trust is evident across similar settings. Highlighting EI's impact on trust and team effectiveness, the study emphasizes the need for focused research in disaster management and suggests integrating EI into hiring, training, and leadership development, to strengthen team resilience and trust in high-stakes environments.

Further information

For additional information scan the QR code or contact:
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FIRES, FLOODS AND PLAGUES:

Bringing together infectious disease and emergency management stakeholders

Authors: Claire Leppold, George Taiaroa

How ready are we for overlapping infectious disease outbreaks and weather-related disasters?

THE PROBLEM

Climate change is projected to increase the likelihood of **infectious disease outbreaks and weather-related disasters**. However, while many organisations work respond to one of these threats, there has been limited work to address them together. There are gaps in public and professional discourse about the ways that infectious disease outbreaks and disasters could happen concurrently in the future.

WHAT DID WE DO?

We conducted interviews with **20 researchers, practitioners, government workers and citizen scientists** in relevant fields about the ways they imagined the best-case scenario and worst-case scenario for how infectious diseases and disasters could overlap in five years time. This project analyses these expert perspectives to create three likely scenarios using strategic foresight methodology. The purpose of the scenarios is:

- To **raise public awareness** of the risks of overlapping infectious disease outbreaks and weather-related disasters
- To **increase knowledge of these risks** within government and non-government organisations that have a role in health and/or disaster management
- To **identify areas in need** of further study
- To be used in **policy reviews** within organisations (e.g. to identify the extent to which current preparedness planning accounts for these scenarios)

A PREVIEW OF THE SCENARIOS

In a regional Victorian town, a teenage boy tests positive for high pathogenicity avian influenza at the same time as emergency flood warnings are released. Many people are distracted by the news of the outbreak and miss the flood evacuation warnings, becoming stranded among bird carcasses in flood waters...

Bushfires cause animals to move closer into a town near a capital city. Many people are experiencing health symptoms from the smoke, at the same time as animal-human contact triggers an outbreak of Tularaemia...

An extreme heatwave happens at the same time as a Hendra Virus outbreak in horses. One human case is confirmed, and it is getting harder to work in emergency response in the extreme heat that continues...

The full fictional scenarios are published online as a public resource.

WHAT CAN I DO WITH THE SCENARIOS?

You can draw on these scenarios in planning meetings or test your current policies against them. We are about to launch a pilot toolkit for individuals to review how prepared their organisation is for overlapping infectious disease outbreaks and weather-related disasters.

Organisations such as community-based organisations, state-level government agencies, local public health units, and more, are eligible to participate. If your work relates to health, or disasters, you are welcome to take part!

If you are interested in participating in the toolkit trial, please visit the QR code to learn more and get in touch.

climate CATCH lab

This project was funded by the Climate & Health Seed Funding 2023-24, Faculty of Medicine, Dentistry and Health Sciences, University of Melbourne.
We extend sincere thanks to everyone who participated in this project.
We also wish to thank project advisors Ann Borda, Katelyn Samson and Lis Ashby.

THE UNIVERSITY OF MELBOURNE

Fostering diversity and resilience

Australasian Women in Emergencies Network

ABOUT US

The Australasian Women in Emergencies Network (AWE) promotes, supports and recognises the contributions of women in emergencies and disasters, building stronger and more resilient individuals, organisations and communities across Australia, New Zealand and the Pacific. AWE provides opportunities for members and allies to benefit from and contribute to the network, and to help build a more inclusive and effective emergency management and disaster resilience sector.

2,000+ members **11 chapters**

OUR MEMBERS

Our members work and volunteer in:

- Community and social services
- Community members and those with lived experience
- Emergency services organisations
- Local, State and Federal Government
- Non-government organisations
- Not-for-profit organisations
- Private businesses and organisations
- Training and development
- Universities

AWE AIMS TO

- Promote and develop women's skills and strengths
- Amplify the voices of women
- Encourage and support women
- Provide a platform for networking and shared information
- Promote collaboration and cooperation
- Encourage gender equity

OUR OFFERINGS

Mentoring | Scholarships | Networking | Events | Newsletters

SCAN THE CODE TO DO YOUR BIT

- Become a member or ally of AWE and show your support for women in emergencies and disasters.
- Learn more about the role of AWE and get involved in your local chapter.

Can transformational leadership enhance hospitals and staff resilience in disasters?

Dr Heba Mohtady Ali [1, 2], A/Professor Jamie Ranse [3], Professor Anne Roiko [1], and Professor Cheryl Desha [1, 2]

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Enhancing Hospitals and Staff Resilience: Transformational Leaders in Disaster Response: Climate change-induced hazards increasingly threaten hospitals worldwide, escalating disaster frequency and severity. Effective leadership are required to maintain quality care amid these environmental challenges. Transformational leadership competencies are significant for developing adaptive, resilient, and effective hospital disaster management strategies.

This research investigated several conceptual and theoretical frameworks that impact hospital disaster resilience, such as 'Resilience Engineering', Total Quality Management's 'Deming Cycle', the 'Resilience Framework for Public Health Emergency Preparedness' the 'Plan-Prepare-Respond-Recover disaster management approach, the 'Hospital Safety Index', and elements from the 'Pan American Health Organization'. Building on these frameworks, the study synthesised existing knowledge on disruptions and critical factors affecting hospital disaster resilience. The research comprised four phases:

Phase 1: A literature review explored disaster terminology, impacts, and management, focusing on COVID-19 and climate. It analysed global and local frameworks, risk and resilience, and healthcare disaster planning competencies, resulting in a 'Hybrid Method for Evaluating Hospital Resilience' and a 'Decision-Support Model for Disaster Resilient Hospitals'. [1]

Phase 2: An integrative review analysed hospital decision-makers disaster lessons, creating a 'Hybrid Resilience Learning Framework' (HRLF) to evaluate resilience and nine learning areas. [2]

Phase 3: Semi-structured interviews with middle-management hospital staff explored factors affecting healthcare workers' capabilities in disasters, leading to a 'Healthcare Workers' Conceptual Framework' with training recommendations. [3]

Phase 4: Semi-structured interviews with senior hospital staff identified success factors and challenges, leading to the development of a model, an assessment checklist, and a competency framework. All these tools aim to achieve hospital disaster resilience by empowering transformational leaders. [4]. See Figure 1.

Figure 1. Transformational Leadership for Hospital Resilience

In conclusion, this research provides hospital leaders with evidence-based tools to strengthen their competencies and ensure disaster resilience for their hospitals.

References

1. Ali, H.M., et al., *Planning and assessment approaches towards disaster resilient hospitals: A systematic literature review.* International Journal of Disaster Risk Reduction, 2021. **61**: p. 102319.
2. Ali, H.M., et al., *Investigating Organizational Learning and Adaptations for Improved Disaster Response Towards "Resilient Hospitals:" An Integrative Literature Review.* Prehospital and Disaster Medicine, 2022. **37**(5): p. 665–673.
3. Ali, H.M., et al., *Healthcare Workers' Resilience Toolkit for Disaster Management and Climate Change Adaptation.* International Journal of Environmental Research and Public Health, 2022. **19**(19): p. 12440.
4. Ali, H.M., et al., *Enabling Transformational Leadership to Foster Disaster-Resilient Hospitals.* International Journal of Environmental Research and Public Health, 2023. **20**(3): p. 1-18.

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The Future Emergency Manager—Designing and Implementing a Future Model for the Sector

Russell DIPPY CSU, LEM, CEM, TQC, FAcEM, CESM, MEmMgt
Doctor of Public Safety Student—Charles Sturt University
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WHAT IS THE PROBLEM?

Emergency events are increasingly impacting the Australian community. Preventing, preparing, responding and recovering from emergencies is a role undertaken by a person known colloquially, but amorphously as an emergency manager.

THE RESEARCH QUESTION?

What human capacity demands should inform the development and appointment of an emergency manager?

RESEARCH SCOPE

- Australian Emergency Events
- 1/1/1997 to 31/12/2017
- Judicial and Semi Judicial Inquires

(judicial and semi-judicial inquires have independence and a requirement to provide information—hence better data)

WHAT DID THE LITERATURE SHOW?

- Emergency Management is not recognised as a Profession—it is a vocation
- Therefore, emergency managers can not be considered professionals
- A profession requires
  - Specialized or complex and extensive body of knowledge
  - Tertiary Education
  - A Code of Ethics
  - A Level of Autonomy enforced by a body of peers
  - Reasonable Payment
  - Certification
- There are now 4 certification schemes in Australia
- There is a small uptake of qualifications across Australia.

THE METHOD

- Locate and Review Inquiry Reports (63 events, 91 reports, 15,612 pages of report, 111 Human Capacities Identified)
- Interview 8 Inquiry Authors (10 hours of transcript, 237 pages of interview, 232 Human Capacities Identified)
- Analyse and classify Human Capacities as based on 'Depth or Breadth of Knowledge' or as a 'Skill or Behaviour'.

Emergency Management is undergoing a journey of professionalization—How can we support that?

THE CONTINUUM OF A VOCATION TO A PROFESSION

NEW DEFINITIONS

- ***Emergency Manager –*** *a person who undertakes a managerial function, working within or across government, private or community sectors, to holistically plan, prevent, prepare for, respond to and / or recover from an emergency or potential emergency event.*
- ***Response Manager –*** *a person who undertakes a managerial role across government, private or community organisations in the response to (including preparation for response), an emergency event. This includes roles such as Incident Controller or Incident Manager, or agency Commander or Controller.*
- ***Recovery Manager –*** *a person who undertakes a managerial role across government, private or community organisations in the recovery from (including preparation for recovery) an emergency event. This includes roles such as Recovery Manager or Recovery Coordinator.*

THE EMERGENCY MANAGEMENT DISCIPLINARY SPECTRUM

Applying Disciplinary thinking to Emergency Management

- Discipline – Single Agency
- Multidisciplinary – multi agency event
- Interdisciplinary – applying other disciplines skills to your event
- Transdisciplinary – working with the community

THEMED HUMAN CAPACITIES OF THE EMERGENCY MANAGER

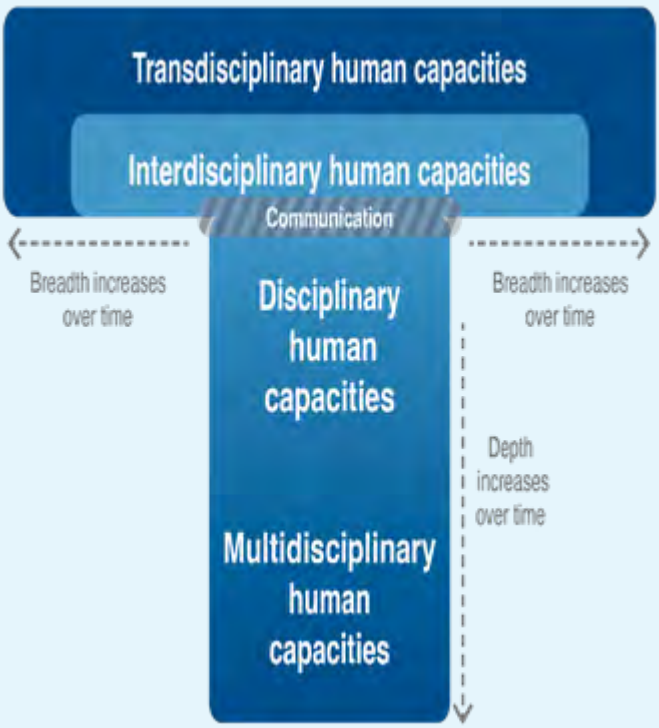
Breadth

- Unbounded problem analysis and problem-solving skills including the application of hazard and community information
- Understanding of the broad cardinal impacts of an emergency event
- Ability to communicate omnidirectionally in the management of the emergency
- Ability to develop, integrate and lead multi-community teams
- High levels of emotional intelligence
- Understanding of risks and the ability to avoid risk paralysis
- Deep self-understanding of skills and abilities, and the means of supplementing them with a team-based approach
- Understanding and experience of leadership and management styles and the appropriate application of each.

Depth

- Knowledge and understanding of the tactical, operational and strategic aspects of the discipline and organisation
- Identification and application of disciplinary and non-disciplinary resources while acknowledging the limitations of those resources
- Exhibits a presence that includes leadership, command, openness, confidence, acceptance of responsibility and calmness
- Judgement based on ongoing self-development, experience, education, qualification and certification
- Ability to communicate omnidirectionally in the management of the emergency
- Decision making in the face of stressors of time and limited information.

THE NEW MODEL—THE EMERGENCY MANAGEMENT T-SHAPED TRANSDISCIPLINARY MODEL ©



Australian Rural Leadership Foundation

Regenerate

BUILDING RESILIENT LEADERSHIP IN OUR REGIONS

Empowering bushfire-affected communities through connection and collaboration

More and more communities are looking to their own to lead disaster recovery efforts to revive and reinvigorate their towns. The Regenerate Regional Leadership Development program responded to this by building leadership capacity via networks of local leaders in bushfire affected regions in NSW and the ACT, focusing on community, volunteers and emergency responders.

Regenerate wasn't the typical professional development training. It was an experiential learning program that pushed participants well beyond their comfort zone. They learned the value of adapting in the face of change, systems thinking, leading with difference and reflection.

The residential approach, removing participants from everyday distractions, created deep bonds of trust and connection between participants, and a greater acceptance of diverse backgrounds, personalities and views.

Enabling a diverse group of people to get together and find solutions, rather than deferring to an authority for them, is the key to transforming communities into vibrant and sustainable places that people call home. They know that when future emergencies, or opportunities occur, their Regenerate leadership networks will be invaluable.

Key Outcomes

- **COMMUNITY RESILIENCE:** The leadership network established through the programs positively impacted community resilience, with the vast majority of participants recognising an increase.
- **CAPACITY FOR DEALING WITH NATURAL DISASTERS:** The vast majority of participants from all regions reported improved capacity to handle future natural disasters after completing the program.
- **BROADENING REACH AND BUILDING CAPACITY:** Participants have taken on leadership roles to raise their organisation's profile, expand outreach, and build capacity by connecting with other networks in the region.
- **COLLABORATION AND ALLIANCES:** Participants emphasised the importance of networks and alliances, stating that achieving community goals is easier and faster when working with like-minded individuals, but also the value of working with people from diverse backgrounds.
- **CONFIDENCE AND EXPLORATION:** All participants reported an average increase of 40% across a broad range of leadership capabilities from commencement to completion of the program.
- **BUILDING RELATIONSHIPS:** Participants formed strong relationships based on deep listening, respect, and affection, which contributed significantly to the overall impact of the program.
- **CONFLICT RESOLUTION SKILLS:** Participants in all regions developed strong conflict resolution skills during the program, which they were able to apply in their community post-program.
- **EMERGING THEMES FROM CASE STUDIES:** In-depth exploration of stories revealed themes such as the importance of self-care, respectful relationships, intergenerational connections, and recovery, adding depth to participants' experiences.
- **LIFE-CHANGING IMPACT:** The program had a life-changing impact on many participants, leading to job changes, volunteering in emergency services, increased invigoration, and confidence in various endeavours, with long-term benefits for their communities.

Our Partners

Australian Government · NSW Government · GlobalGiving · Minderoo Foundation · FRRR · Bega Valley Regional Council · SHASA · Global Learning · Australian Resilience Centre · Cuppacumbalong

The Regenerate Regional Leadership Program was jointly funded by the Australian and NSW Governments under the Bushfire Local Economic Recovery Fund.

Testimonials

Robbie Thompson
ACT Fire and Rescue
– Capital Region cohort

"I think the important thing to note is if we have any sort of natural disasters be it fires, flood or drought, we now know through that collective of people who we can contact within our networks to get stuff done, to support each other, to build resilience in our communities, to build resilience within ourselves."

"I think it takes a lot of courage to recognise who you are as a person, but then what other people can bring to the table as well. And try and fill all those gaps and ensure that all voices are heard. I think that was one of my key things, understanding who I was as a person but then also understanding how to evaluate other people and what strengths they can bring."

Penny Green
Energy Strategy Specialist
– Bega Valley cohort

Danielle Leseberg
RFS Volunteer
– Snowy Valleys cohort

"The course clarified for me that, even though I didn't hold a leadership title with the RFS, I was still leading people without fully realising it. I think I'll be more level-headed during emergencies now as I'll be confident enough in my leadership skills to help other leaders do what they need to do and help people prioritise what needs to be done. I also learnt how to be a better listener as learning to listen is a big part of learning to lead."

Visit **rural-leaders.org.au** to learn more about our regional leadership programs and read the stories of other alumni who are leading, inspiring and navigating transformational change in regional Australia. Get in touch if you'd like a program in your region.

ABV

Australian Business Volunteers

Providing the networks, skills & knowledge to strengthen communities to lead their own resilience.

HOW WE WORK

1. **CONSULTATION**
   Building foundational trust with communities while identifying their key needs, priorities and interests.

2. **PLACE-BASED ENGAGEMENT**
   Working in the community, with the community to discover unique characteristics, drawing on local knowledge and resources.

3. **CREATING A SAFE SPACE**
   Creating social safety as community holds the sometimes-difficult conversations to determine actions.

4. **ENGAGING VOLUNTEERS & NETWORKS**
   Sourcing specialist volunteers to complement local skills. Expert knowledge accelerates projects.

5. **FEEDBACK LOOP**
   Regular review sessions keep feedback consistent and provide continuous improvement. ABV feeds its learnings into our advocacy work and understanding of the systems change needed.

"The offer from ABV of pro bono services couldn't have come at a better time - the 9-month mark post catastrophic bushfire found our community in severe fatigue"

COBARGO COMMUNITY PARTNER

OUR UNIQUE VALUE PROPOSITION

COMMUNITY

Self-determined Economic Resilience.
Expert assistance to accelerate recovery.
ABV's advocacy drives systematic change.

PARTNERS

A step away from BAU for employees which increases engagement and retention of staff.
Long-term benefits of a robust social strategy.

VOLUNTEERS

Meaningful application of volunteer's skill sets and experience.
Flexible, remote-based volunteering assignments.
Fully supported throughout volunteer life.

FIND OUT MORE

WWW.ABV.ORG.AU
HELLO@ABV.ORG.AU

DISASTERWISE COMMUNITIES NETWORK

DISASTERWISE

DISASTERWISE ACKNOWLEDGES AND PAYS RESPECT TO THE PAST, PRESENT AND FUTURE TRADITIONAL CUSTODIANS AND ELDERS OF THIS NATION AND THE CONTINUATION OF CULTURAL, SPIRITUAL AND EDUCATIONAL PRACTICES OF ABORIGINAL AND TORRES STRAIT ISLANDER PEOPLES.

BACKGROUND

In an era of escalating climate-induced disaster events, our society faces urgent and multifaceted challenges. Disasters are increasing in frequency and intensity, disproportionately affecting communities disadvantaged by the system.

Addressing these interconnected challenges requires a transformative and innovative approach that goes beyond the current overburdened and top-down systems.

THE VISION

A growing movement of people who are building disaster resilience through self-determination and community-led action.

THE PURPOSE

To enable diverse communities to better **connect**, **learn** from each other and support one another to drive real **change**.

The DisasterWISE Communities Network is tackling these critical issue by creating a vibrant community-led space for connection, dynamic learning and transformative change.

THE HOW

Cultivating Connections and Building Trust:
We foster deep, trusting relationships within and across organisations and communities.

Brokering Diverse Knowledge:
We integrate and respect varied ways of knowing and experiencing disasters across our membership.

Amplifying Community Voices:
We elevate community voices as equal partners in recovery and resilience, influencing broader disaster policy.

Advocating for Community-Led Approaches:
We champion and support initiatives that promote stronger, just, and thriving communities.

CO-DESIGNING A NETWORK FOR COMMUNITY RESILIENCE

Between August and November 2022, a group of 12 people across community, agencies and government were guided through a participatory co-design process to inform and prototype the beginnings of a National Resilient Communities Network, seeded by the Fire to Flourish program.

Prototyping began as the group shared and listened to the lessons learned from lived and learned experiences, bringing diverse voices into a brave space to challenge assumptions and transform mindsets. This process resulted in proof of concept that is now being activated.

The insights from co-design have informed the framework, governance, theory of change and ways of working that underpin the DisasterWISE network.

CONNECT-LEARN-CHANGE

The Connect-Learn-Change framework provide the overarching principles, incorporating five key elements that guide DisasterWISE ways of working.

WHAT'S NEXT FOR THE NETWORK

The DisasterWISE Network has commenced online monthly get-togethers, hosting theme-related dialogues to bolster community disaster resilience. Participants from communities and organisations learn from each other's lived and learned experience through storytelling and showcasing community-led initiatives. This relational way of working maintains a human centered approach, showing up as 'humans first' in the DisasterWISE space.

DYNAMIC GOVERNANCE

The DisasterWISE network has been seeded by the Fire to Flourish program, receiving cornerstone funding from Monash University and the Paul Ramsay Foundation. To ensure its independence and act as stewards for the network, the founding members are establishing an independent company (DisasterWISE Pty Ltd.) with a board of directors. Currently, the Network Action Group is seeking funding partners to support the growth and scale of the DisasterWISE Community Network.

STORY FOR PURPOSE

A DisasterWISE initiative that amplifies community voices in the disaster space by telling 'our stories, our way", Story for Purpose explores and demonstrates the power of Story; by enhancing dynamic, peer to peer learning and inspiring critical conversations as a pathway to systems change.

KNOWLEDGE LIBRARY

DisasterWISE are developing a knowledge base to curate a collection of Community-led resources, with supporting research and evidence.

POSSIBLE FUTURES

DisasterWISE will convene a series of conversations bringing together community knowledge and technical expertise to identify barriers and develop practices for effective disaster response partnerships.

Come and speak to us! We are located at 'Resilience Lane'.

MONASH University | MONASH SUSTAINABLE DEVELOPMENT INSTITUTE | paul ramsay FOUNDATION | ELECTRICAL MERCHANDISING | THE AUSTRALIAN CENTRE FOR SOCIAL INNOVATION

THE GAP

I wish there were OPPORTUNITIES TO LEARN ABOUT DISASTER PREPAREDNESS...

I want to help my COMMUNITY TO SELF-ORGANISE.

I want to learn the SKILLS NEEDED TO CONTRIBUTE!

We learn from HANDS ON EXPERIENCES!

PROJECT ORIGINS

YOUNG PEOPLE SUGGESTED 86 WAYS TO IMPROVE THEIR OUTCOMES, BEFORE, DURING AND AFTER EMERGENCY. THIS PROGRAM IS DESIGNED TO MEET 38 OF THEM!

OUR VISION

×100 COMMUNITIES IMPACTED BY YOUNG PEOPLE!!

AUSTRALIAN RED CROSS

Co-designed

YOUTH IN EMERGENCIES

DEVELOPMENT PROGRAM A DUKE OF EDINBURGH INTERNATIONAL AWARD

Young people are UPSKILLED through PRACTICAL application of VOLUNTEER PROJECT

Addressing key resource gaps!

6 MONTH PROGRAM

- PREPAREDNESS, RESPONSE AND RECOVERY
- DIVERSE COMMUNITY IMPACTS
- LEADERSHIP AND TEAMWORK
- EMERGENCY MANAGEMENT
- VOLUNTEER PROJECT TO PREPARE THEIR COMMUNITY
- ADVENTUROUS JOURNEY!

Organisations can TRUST US AS LEADERS!

I CAN LEAD by assisting orgs. to plan with my communities.

THE PROGRAM

THE OUTCOMES

On The Edge of Transformation: *Transforming Disaster Resilience Education in Schools*

Belinda Davis,[1] Alan Reid,[1] Susie Ho,[2] Briony Rogers[3]

[1] Faculty of Education, [2] Faculty of Science, [3] Monash Sustainable Development Institute - all Monash University

Transforming Approaches to Natural Hazard and Disaster Resilience Education in Schools Through New Theoretical Understandings and Practice Models

International policy frameworks, such as the Sendai Framework for Disaster Risk Reduction, have positioned children as agents of change with the potential to (a) create transformative action in their communities, and (b) protect themselves and others from the impacts of natural hazards and disasters. *This research explores education's role in achieving such outcomes*.

What Is Transformative Education?

Transformative educational experiences are conceptualized as **those that are meaningful** in that they are **reflective of social-environmental change in communities** - in this case, change is enacted through **collective agency for community resilience to disaster**.

Rationale and Questions

Scholarship and policy have consistently argued Disaster Resilience Education should integrate both aspects of natural hazards and the social environment. However, current school-based education programs rarely achieve this.

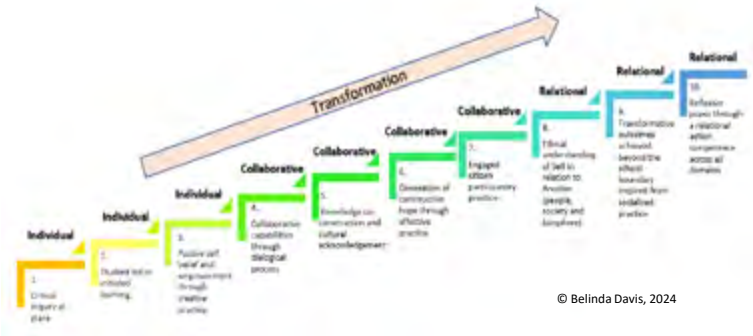
In addition, most existing approaches are commonly predicated on basic knowledge-action-behaviour (KAB) models favouring **instrumental** rather than **transformative** approaches to enacting social change within and beyond the school boundary.

Research Aims and Outcomes

The research aims to develop better grounded **models of transformative education for disaster resilience in schools** underpinned by sound and contemporary educational philosophy, theory and best practice.

Methodology

Transformative educational 'steps' were qualitatively synthesized through a **process of abduction** from concepts identified from educational scholarship that locate **agency, relationality and transformation** as central proponents. These steps were validated through a critical review of **45 international natural hazard and disaster resilience school education programs**.



Findings: Building a Stairway to Transformation

The case analysis suggests **10 key steps** denoting **transformative education qualities** along an **elevation of relationality** towards higher potentiality for transformative educational outcomes.

The 'steps' illustrate a foundational baseline for informing the development of an **Axiology for Social Forms** of Transformative Natural Hazard and Disaster Resilience Education, as well as the creation of new models of transformative education.

The steps can also be clustered across individual, collaborative and relational **spheres of influence**. Although represented linearly above, in practice, there is nuance flowing from back and forth interactions.

Further information

For additional information scan the QR code or contact:
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Understanding multicultural communities in Australia - challenges and opportunities for inclusive resilience building for disasters

Dr Lai Heng Foong BMBS, FACEM, MHS, BA(Hons), Mr Len Morris BAPS (Hons), MA

Disclaimer: the views and analysis expressed in this poster are solely that of authors and do not represent their employers or any organisations they are affiliated with.

Background

Australia is one of the most culturally and linguistically diverse countries in the world. Southwest Sydney is one of the most multicultural areas in New South Wales. In 2021, 38.8 % of population of this Local Health District were born overseas and 46.4% of its population speaks a language other than English at home. Our project aims to explore ways to operationalise disaster risks and resilience within multicultural communities in Australia to inform policies and programmes through two means. First, it analyses correlation between components of the Australian Disaster Resilience Index (ADRI) and multicultural communities within the Australian Bureau of Statistics (ABS) Statistical Areas Level 2 (SA2). Second, it evaluates a pilot project to build community resilience during disasters by understanding existing vulnerabilities, consulting with stakeholders and increasing awareness of disasters through education and building capacity.

Methodology in understanding vulnerabilities

We analysed the correlation between the ADRI scores and the percentage (%) of people who speak languages other than English at home in the ABS SA2s from west and south west Sydney using the ABS 2021 Census. The ADRI was developed by academics from the University of New England and the Natural Hazards Research Australia (formerly Bushfire and Natural Hazards Research CRC). The ADRI is composite, spatial data that uses top-down assessment approach relying on secondary data, such as the ABS Census, and contains 77 indicators (Parsons et. al, 2021). It assesses communities' capacities to cope with and adapt to impacts of disasters. The capacities are categorised and quantified into following 8 themes:

ADRI capacities	Social character	Social and community engagement	Governance and leadership	Information access	Community capital	Emergency services	Economic capital	Planning and the built environment
Capacities description	The social characteristics of the community. Represents the social and demographic factors that influence the ability to prepare for and recover from a natural hazard event.	The capacity within communities to adaptively learn and transform in the face of complex change. Represents the resources and support available within communities for engagement and renewal for mutual benefit.	The capacity within organisations to adaptively learn, review and adjust policies and procedures, or to transform organisational practices. Represents the flexibility within organisations to learn from experience and adjust accordingly.	The potential for communities to engage with natural hazard information. Represents the relationship between communities and natural hazard information and the uptake of knowledge required for preparation and self-reliance.	The cohesion and connectedness of the community. Represents the features of a community that facilitate coordination and cooperation for mutual benefit.	The presence, capability and resourcing of emergency services. Represents the potential to respond to a natural hazard event.	The economic characteristics of the community. Represents the economic factors that influence the ability to prepare for and recover from a natural hazard event.	The presence of legislation, plans, structures or codes to protect communities and their built environment. Represents preparation for natural hazard events using strategies of mitigation, planning or risk management.

Figure 1: capacities measured by the ADRI (Source: Parsons et. at, 2021)

Results

Below table shows the correlation between the resilience capacities quantified by the ADRI and the % of people who speak languages other than English at home from 138 SA2s in west and south west Sydney. Closer the numbers are to -1 or 1, the stronger the correlation is. While the figures below do not show causal relationship, it is able to indicate the strengths of the relationship between different capacities for disaster resilience and % of SA2s' population who speak languages other than English at home.

ADRI capacities	Social character	Social and community engagement	Governance and leadership	Information access	Community capital	Emergency services	Economic capital	Planning and the built environment
Correlation	-0.9034	-0.5196	0.2061	0.4957	-0.7497	-0.6276	-0.4947	Result not statistically significant

Figure 2: correlation analysis results *n=138, p<0.05 for all results except for planning and the built environment. The correlation was calculated with Spearman's rank correlation using the Stata software.* Data sources: Australian Bureau of Statistics (2021), Natural Hazards Research Australia

Analysis

Through their indicators, these resilience capacities capture diverse social capital ranging from neighbourhood safety to engagement with emergency management organisations (social capital is defined as the networks that connect individuals to each other either through weak or strong ties that could provide information and access to resources (Aldrich, 2017, pg 358)):

- Social character - % population arrived in Australia after 2001, % of labour force unemployed, % lone households, % households with all or some residents not present a year ago, etc.
- Community capital - age standardised number of people per 100 population who are able to get support in times of crisis, age standardised number of people per 100 population who feel safe walking in their neighbourhood, % population undertaking voluntary work, etc.
- Emergency services - Fire and emergency services workers/Ambulance officers and paramedics/fire service volunteers/SES volunteers per 1000 population, etc (Parsons et. al, 2021).

Our analysis shows that capacities that contain indicators for social capital tend to have stronger negative correlation with capacities with % of people who speak languages other than English at home, and indicates that SA2s with strong presence of multilingual households may not be able to rely on social capital to cope with the impacts of disasters.

This is a correlation analysis, therefore does not show causal relationship between the variables. However, it is still able to show an overview of disaster risks multicultural communities face in south west Sydney. It is also worth mentioning that the social character's high negative correlation with % of people who speak languages other than English at home in SA2s may be due to one of the indicators for the capacity being % of people who speak English not very well or not at all. However, the analysis still has its merits given the other negative correlations in the table above, and the capacity having fourteen other indicators.

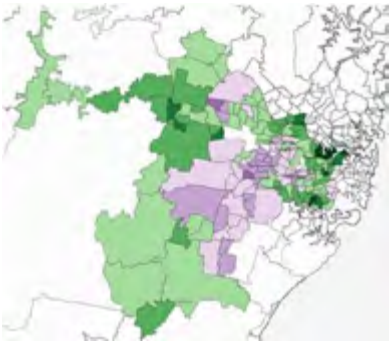


Figure 3: SA2s in west and south west Sydney (image source: Natural Hazards Research Australia)

Enhancing Disaster Resilience in South West Sydney - The Building Community Resilience for Disasters Toolkit

The Building Community Resilience for Disasters Toolkit is a project that focuses on empowering community with knowledge and practical tools to managing disasters within their respective communities. The project aims to:

1. Improve the resilience of communities to adapt and mitigate the health impacts of climate change on themselves and other community members.

2. Improve preparedness of communities to manage natural disasters by education and mock disaster training.

Methodology

Multicultural Health Service in Southwest Sydney Local Health District organised two workshops and a webinar using the Building Community Resilience for Disasters Toolkit:

1. To educate community leaders about Extreme heat, importance of community resilience in mitigation and adaptation of climate change induced disasters, with a focus on extreme heat;

2. To deliver a webinar to teach the community leaders how to deliver the education package to community members in different languages; and

3. To educate community members about extreme heat and how to protect themselves and their families and share resources that are available.

Effectiveness of the Building Community Resilience for Disasters Toolkit

Surveys were conducted prior to and after the workshops and webinar to assess their effectiveness. Below graph shows improvement in participants' understanding on heat wave risk and increase in the capacity to prepare their communities for future heat wave events:

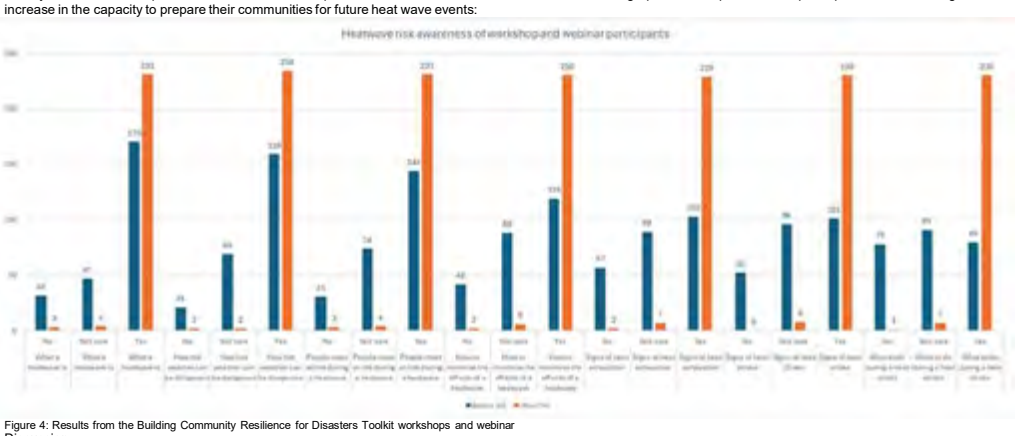


Figure 4: Results from the Building Community Resilience for Disasters Toolkit workshops and webinar

Discussion

The vulnerability analysis using the ADRI indicates that resilience capacities that contain indicators of social capital tend to have negative correlations with SA2s' % of population who speak languages other than English at home. This indicates that multicultural communities in SA2s in west and south west Sydney may not be able to utilise social capital to cope with the impacts of future disasters.

On the other hand, the qualitative data from the Building Community Resilience for Disasters Toolkit workshops and webinar indicates that empowering existing community networks within multicultural communities through knowledge building can be an effective method for disaster resilience building.

These results complement each other by emphasising the importance of social capital for multicultural communities' resilience to disasters in Australia from both top-down and bottom-up perspectives. They offer the following important implications for disaster resilience building for multicultural communities in Australia.

1. Disaster resilience building initiatives should incorporate stakeholder knowledge and co-design within multicultural communities, rather than just translating existing resources.
2. There should be more opportunities for multicultural communities to develop disaster risk understanding.
3. Enhancing social infrastructure and community connectedness within multicultural communities, or areas with high multicultural population, is likely to be an effective method to build disaster resilience in multicultural communities.

Conclusion

Our research shows how disaster risks may manifest for and how to build disaster resilience within multicultural communities. Future directions would include scaling this method and exploring how it may inform policy and planning.

Reference List

Australian Bureau of Statistics (2021), *2021 ABS Census*, DOA 19 October 2023.

Aldrich, Daniel (2017), "The Importance of Social Capital in Building Community Resilience" in Wanglin Yang and WIll Galloway (ed) *Rethinking Resilience, Adaptation and Transformation in a Time of Change*, Springer Books, pg 357-364.

Australian Disaster Resilience Manual 44: Guidelines for Emergency Management in CALD Communities, 2007, Australian Institute for Disaster Resilience, CC BY-NC

Natural Hazards Research Australia , *Australian Disaster Resilience Index*, accessible at https://adri.bnhcrc.com.au/#!/maps, DOA 19 October 2023.

Parsons M, Reeve I, McGregor J, Marshall G, Stayner R, McNeill J, Hastings P, Glavac S & Morley P (2020), t*he Australian Disaster Resilience Index: a summary*, Bushfire and Natural Hazards CRC.

Parsons, Melissa et. al (2021), "Disaster resilience in Australia: A geographic assessment using an index of coping and adaptive capacity" in *International Journal for Disaster Risk Reduction*, vol.62 (August), DOI https://doi.org/10.1016/j.ijdrr.2021.102422.

Barriers to Parent Engagement in Pro-Environmental Behaviour

Laura Burman
PhD Candidate
Deakin University | School of Psychology

The Participants

- 2 Male, 5 Female
- Aged 46-53 years
- Children aged 12+
- On a scale of 1-10, all participants were highly concerned about the environment(all rated 10, except one 8)

Homogenous sample: A nationwide qualitative online survey (*N* = 249) was conducted in May, 2024 to collect data from a broader sample

What do parents need to behave more sustainably

- Reputable & easily accessible information
- Incentives & rewards for sustainable behaviour
- Affordability and social equity
- Infrastructure & accessibility
- Personalised guidance & support

"It's always very, very easy to find international resources, and then you look at it, and you think, okay, well, this might be helpful but not for where I am. Or it'll be Sydney based or New South Wales based or Queensland based. And that's all great for them, but I want it to be for this particular environment."

The Study

Two 2-Hour Focus Groups (*N* = 7)

Conducted in partnership with Yarra Ranges Council, Victoria

September, 2023

Where do parents find information when they want to behave sustainably

- Family and friends
- Groups (e.g., permaculture groups)
- Libraries
- Local festivals & events
- Internet (although they often find this overwhelming)
- Government and Council websites

"I created an education resource for the kindergarten using the council website of what can go in, what bins and that."

What's Next?

Co-designing a pilot intervention study to reduce parent household energy use in the Yarra Ranges Council area

Why Parents?

- Parents produce over 25% more carbon emissions than their childless counterparts (Nordstom, 2020)
- Parents with dependent children make up 60% of Australian households (ABS, 2021)

Parent concerns about how climate change will affect their lives

- Extended seasons, bushfires and flooding
- The difficulty of recovering from the increasing disasters resulting from climate change

"Bushfire is one thing I felt...this is something you can't really fight against... it's one ofthe main concerns I have...when it comes to climate change".

BARRIERS

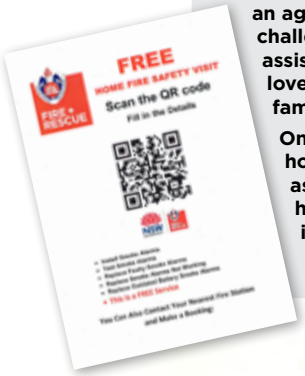
- Difficulty finding current and relevant information
- Financial limitations
- Time poor

MITIGATING FIRE RISK FOR AGING AND DISABILITY POPULATIONS IN OUR COMMUNITIES

Linking support workers and carers with firefighters

With higher life expectancy rates, Australia is facing an aging population which causes associated challenges for families. With the rising cost of assisted living and families adverse to placing loved ones into a care facility, a greater number of families are electing to provide care themselves.

One of the challenges of providing care in the home and managing complex health issues such as dementia is reducing the risk of fire in the home. The effects of dementia such as changes in mood, memory, thinking and behaviour all increase the risk of fire.



2023 – 49% OF HOMES IN NSW DO NOT HAVE A WORKING SMOKE ALARM
(source FRNSW eAIRS incident data).

Fire and Rescue NSW (FRNSW) is concerned by the large number of homes that do not have working smoke alarms. One way FRNSW is addressing this is by partnering with home care and disability support providers to promote free Safety Visits.

A Safety Visit is where firefighters are invited into someone's home to provide bespoke fire safety advice to reduce their risk of fire. If a resident doesn't have a working smoke alarm, FRNSW will install one. A Safety Visit can be requested by the resident or their carer by scanning a QR code. This information also becomes part of a client's care communication folder.

Many clients don't have the ability to test their own smoke alarm, or ensure one is installed, due to vision impairment, mobility diseases or having no family support network. This is one of the reasons why a program that connects with carers and support workers who are already in the client's homes has been so successful. Care providers also have a WH&S obligation to their employers when they are in other people's homes.

Client and staff testimonials: What the FRNSW QR Code and Safety Visit support means to clients

- Client Gina: "Because I am older and I have Parkinson's disease, not being able to do the small things like check batteries or check the smoke alarms, this can cause something big like a fire and not knowing until it's too late. Having the fire station come to my home and check my smoke alarms and replace one, makes me feel so much safer."
- Staff Jess: "This is such an amazing initiative that I feel prioritises the safety and welfare of our vulnerable older community. My clients have been delighted to have lovely local firefighters attend to provide fire safety advice and ensure their smoke alarms are in working order."

PEOPLE AGED 65 AND OVER ARE THE HIGHEST FIRE FATALITY RISK GROUP IN THE COMMUNITY.

Dementia Fire Safety Strategy Toolkit:

The program also provides dementia carers with information about adjusting home life to mitigate fire risk.

When considering the needs of someone with dementia, it is important to find the right balance between independence and adequate protection. Here are some considerations:

- **Install a greater number of smoke alarms.**
- **Identify the risk in the event of a fire due to deadlocked windows and doors compromising escape plans.**
- **If the person with dementia is likely to get up at night, motion sensor lights are ideal.**
- **If you think a person with dementia may not recognise something poisonous, lock away any poisonous substance, such as bleach, disinfectant and cleaning products.**
- **If necessary, consider fitting isolation valves/kill switches to gas or electric cookers, so that the cooker cannot be turned on and left on.**
- **If the person no longer seems able to recognise danger, remove any potentially dangerous implements, such as sharp knives, electric appliances such as kettles/irons. Consider a kitchen electrical isolation switch.**
- **Flood detectors are also useful in case taps are left on.**
- **Never leave a candle unattended and never dry clothes over a heater.**

NSW GOVERNMENT

For more information about safety visits

fire.nsw.gov.au/visits

FROM VULNERABILITY TO STRENGTH: EMERGENCY PLANNING WITH PEOPLE WITH DISABILITIES USING PERSON-CENTRED APPROACHES

In 2023/24 the Country Fire Authority (CFA) and Australian Red Cross co-piloted a household fire and emergency planning service called EPAS - Emergency Planning Advice Service, targeted to people at higher risk, including people who need extra support because of a disability and/or being older. This was delivered in partnership with 9 Local Government Areas in Victoria.

FRIENDS AND SMOKE ALARMS

Bernard is a widowed, elderly man who lives on his own in South Western Victoria. He has reasonable mobility but needs a walker and uses a lift to move up and down in his double-storey home. His property is on the edge of the Otway's forest in a high-risk fire danger area.

He was unsure of his trigger to leave or where he would go on a high risk bushfire day. A person-centred discussion, helped Bernard decide to go to his friend's house in Geelong. He will leave on days of Catastrophic or Extreme fire danger and on any sign of fire in the area.

He had two smoke alarms inside – one not working and the other was very old. Bernard has a large room with an elaborate train set. There is a lot of electrical equipment in this room but no smoke alarm. As part of the household service CFA installed new smoke alarms, including in the train room. Bernard also developed a home fire escape plan.

GOING ON AN EXCURSION

Chris and Jessica live in a high bushfire risk area in the Yarra Ranges with their young family. Concerned about bushfire safety for their family, given one of their children has a disability, they asked to participate.

Their child with a disability finds changes to routine extremely difficult to cope with. A brainstorming emergency preparedness conversation led to the idea of "going on an excursion". They will now use this concept with their son if the family needs to leave early. This will shift what might have been highly disruptive to become something that is manageable. The family now have a written plan for Extreme and Catastrophic days.

The family also installed extra smoke alarms in their home to speed up detection of house fires. They have rehearsed their home fire escape plan to make it more familiar and less daunting for their children.

The Person-Centred Emergency Preparedness (P-CEP) Capability Wheel was used as a conversational tool.

It proved to be effective and helped to unpack barriers and gaps to be addressed.

SHARING RESPONSIBILITY

Michael and Peter live in Central Victoria in an area with a significant bushfire history and profile. They both have an intellectual disability and live in an independent living home with round-the-clock in-home support and care.

During the home visits the bushfire risks in the local area were discussed. Plans were agreed for each type of Fire Danger Rated day. These plans will now be formalised and reflected in processes and training for the service provider and their staff. CFA also provided free bushfire training to the service provider.

Home fire safety was also a concern, so the existing home fire plans were reviewed and enhanced. This included CFA installing additional smoke alarms home and prompting more realistic home fire escape practices.

Importantly, the service provider has adopted these approaches at other homes they manage locally.

PLANNED RELIANCE ON OTHERS

While her house is being completed, Shona lives in a caravan at her sister's property. There is bushland to the north of the property near Bendigo, and risk of bushfire and embers. Shona's disability means she does not drive. She has a part-time carer and her sister works full-time away from the property. In an emergency, Shona would be dependent on others.

During a single home visit Shona understood the bushfire risks and her reliance on others to leave early or evacuate. Shona and her sister discussed the situation with two of their neighbours. The neighbours agreed to help Shona.

Shona and her sister now feel confident that between them, her carer and their neighbours, they have a plan for Shona to get to a safer place on high-risk days.

Watch stories of how EPAS improved emergency preparedness here:

To learn more or get a copy of the EPAS Evaluation contact Angela Cook at CFA Community Engagement angela.cook@cfa.vic.gov.au

Australian Red Cross | CFA

Strengthening Australia's Emergency Preparedness to include our Deaf and Hard of Hearing

Expression Australia

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Auslan Emergency

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Cultural Heritage & Disasters - Advancing Collaboration

Johanna Garnett *(DPublicSafety Candidate, MEmergMgt, GradCertTerrorism&SecurityStud, BA Honours)*

Multiple examples exist in Australia of cultural heritage being damaged or destroyed by hazards. These events highlight our shared responsibility to protect cultural legacies, which are finite, rare, and irreplaceable. Cultural heritage embodies our shared history and societal structures, contributing significantly to social connectedness and unity, making it crucial for building disaster resilience.

Despite its importance, cultural heritage is often overlooked in emergency management.

The Sendai Framework for Disaster Risk Reduction acknowledges, for the first time, its role in resilience building, yet more effort is needed to include it in national and state emergency plans. Safeguarding heritage requires a united effort from government entities, local communities, and diverse stakeholders. Effective collaboration and communication are essential for a cooperative and resilient response.

In late 2023, SAFECOM, with support from Artlab Australia and the History Trust of South Australia, hosted over 60 individuals at Adelaide Town Hall for the inaugural Cultural Heritage & Disasters Forum.

The Cultural Heritage & Disasters Forum was designed to provide a foundational exploration and improved understanding of the challenges and opportunities associated with preserving South Australia's cultural heritage amidst disaster risks. The aim was to build understanding of cultural heritage considerations into the South Australian emergency management context and to facilitate knowledge sharing and build networks between the sectors.

The event served as a platform for the exchange of ideas, the cultivation of collaborative efforts, and the formulation of strategies for the preservation and fortification of cultural heritage that holds significance on personal, community, and state levels.

We are now working towards...

Establishing a collaborative network to facilitate communication and cooperation between cultural heritage stakeholders and emergency management agencies.		
Investigating opportunities to implement a structured process to document and categorise state cultural heritage assets, establishing a GIS mapping system to provide precise location and contact details for emergency services.	Investigating the incorporation of cultural heritage professionals into advisory and decision-making mechanisms to offer strategic guidance for preserving cultural heritage during emergencies.	Investigating the opportunity to conduct joint exercises, risk assessments and drills, provide disaster training programs, support private collectors in preservation measures, and deploy rapid assessment teams with cultural heritage expertise.
Continued development of meaningful partnerships with local Aboriginal communities to safeguard their cultural heritage, fostering mutual understanding and respect.	Ensuring disaster plan templates, tailored to cultural heritage protection, are readily accessible to all.	Engaging all parties to collectively enhance understanding of the risks faced by cultural heritage assets.

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We acknowledge the lands upon which the forum took place and the lands upon which this poster is displayed.

Organising for resilience and justice in the face of disasters

Amir Hossein Pakizeh[1], Nader Naderpajouh[1], Peyman Habibi Moshfegh[1]
[1] School of Project Management, The University of Sydney

Introduction

- In organising urban heat resilience, strategic responses may inadvertently propagate injustices due to the unequal distribution of resources and benefits.
- Despite an increasing recognition of the interplay between climate change and justice, many resilience approaches fail to adequately integrate justice considerations, often treating them merely as indicators rather than integral components.
- Recent studies and critiques call for a more profound engagement with justice in resilience planning, emphasising the need to operationalise justice principles in practical applications, such as the distribution of tree canopies in urban areas (Greater Sydney).
- This involves exploring different theories of distributional justice—utilitarian, egalitarian, prioritarian, and sufficientarian—and examining their practical implications to ensure that resilience strategies are not only effective but also equitable.

Discussion

The study indicates that the distribution of tree canopies in Greater Sydney does not distinctly adhere to any single justice theory:

- The actual distribution of tree canopies more closely aligns with the egalitarian theory of distributional justice, while showing the least alignment with the utilitarian theory (Fig. 1).
- The actual distribution of tree canopies has heightened levels of injustice in terms of access to tree canopy coverage in Greater Sydney compared to preexisting situation (Fig. 2).
- Deviations from justice theories become more pronounced at finer levels of granularity, highlighting the role of granularity in justice assessments (Fig. 1).
- The complexity of justice in this context is acknowledged, noting that simplifications omit crucial socio-economic, cultural, and infrastructural factors.

Result

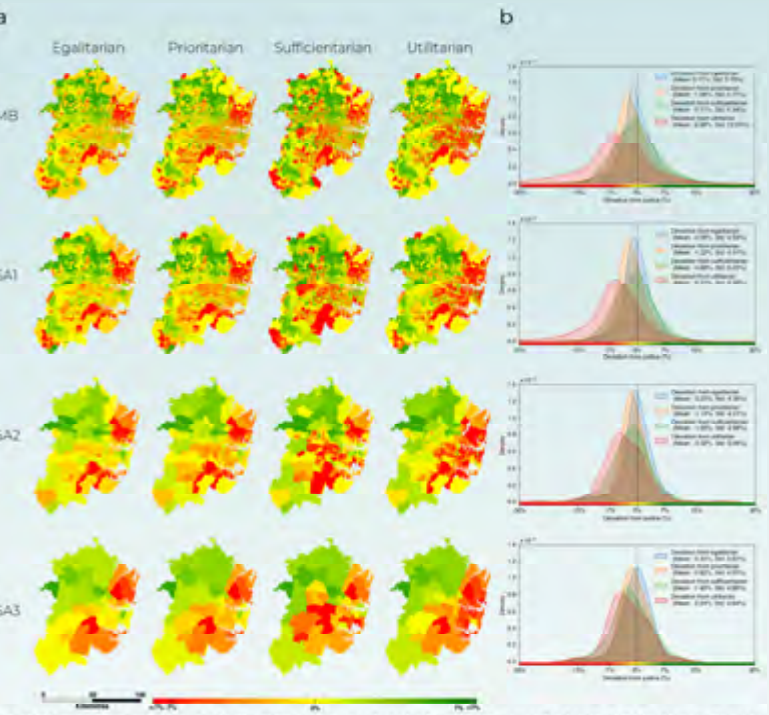


Fig. 1 | Percentage deviation of actual tree canopy distribution from expected just distribution between 2016 and 2022. This analysis covers the distribution of tree canopy across four distinct levels of geographic granularity. Each geographic unit within these categories is treated as a single data point in our analysis. Overall, 52,492 MBs, 10,252 SA1s, 279 SA2s, and 46 SA3s within Greater Sydney were examined to demonstrate the percentage deviation from distributional justice theories (a) spatially across various geographic granularity levels (MB, SA1, SA2, and SA3) and (b) through corresponding nonparametric kernel density estimates showing the mean and standard deviations.

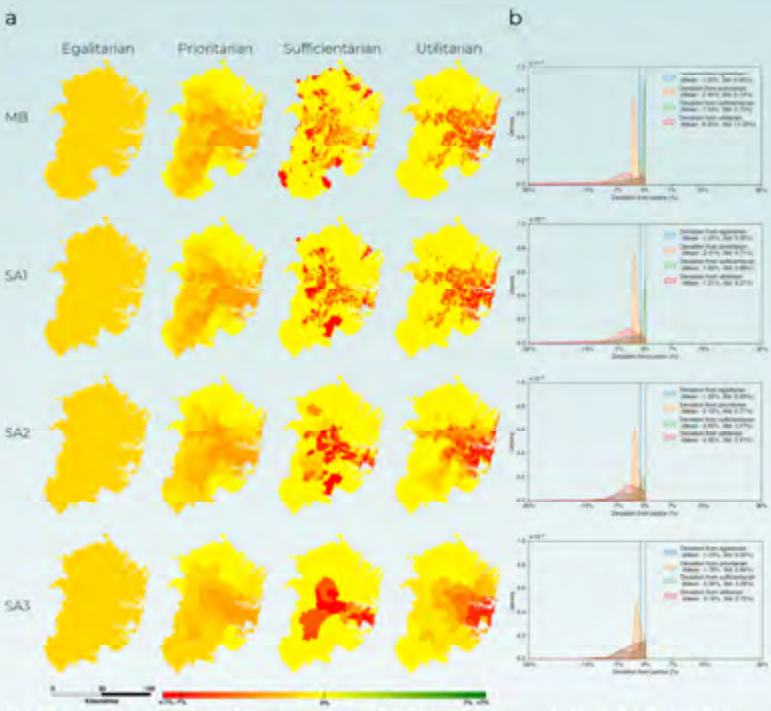


Fig. 2 | Percentage deviation of zero tree canopy distribution from expected just distribution between 2016 and 2022. This analysis uses the expected just distributions as the reference to calculate the deviation when no trees are distributed. This results in negative deviations that indicate underplanting across all geographical units at four distinct levels of geographic granularity (MB, SA1, SA2, SA3). (a) The spatial distributions of percentage deviations are shown for Greater Sydney, categorised by different justice theories (egalitarian, prioritarian, sufficientarian, and utilitarian) and across various geographic granularities. (b) Corresponding nonparametric kernel density estimates are also presented, including mean and standard deviation values.

Methodology

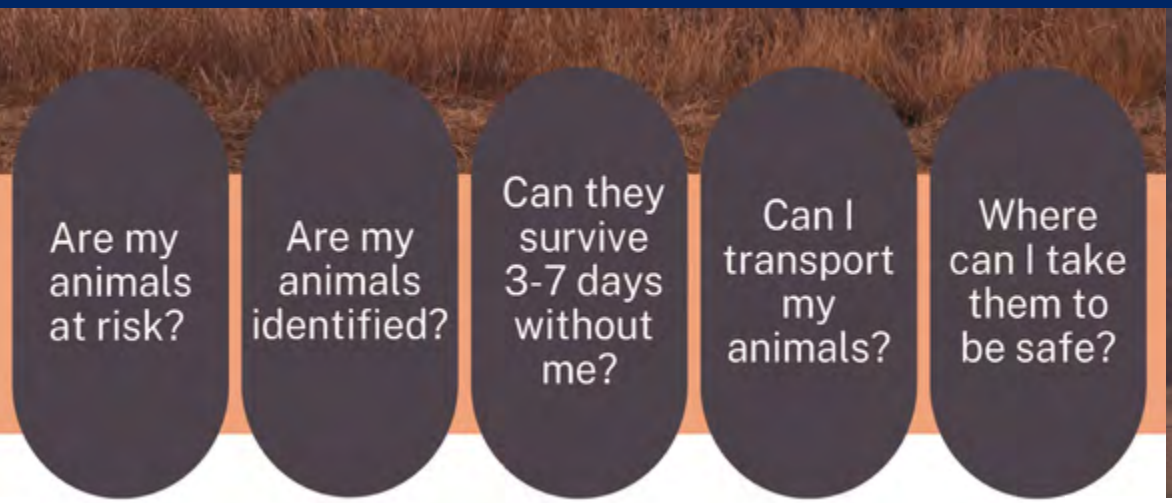
In 2016, Greater Sydney had approximately 1.514 billion square meters of tree canopy, which increased to 1.578 billion square meters by 2022, marking a 4.2% growth. These additional tree canopies planted during this period are considered resources for adapting to heat throughout the region. By adopting the viewpoint of decision-makers in 2016, who were aware of the exact quantity of tree canopies planted up to 2022, it is possible to determine the ideal just distribution patterns based on the justice implications. Furthermore, the actual distribution of tree canopies in 2022 has been recorded, allowing for the calculation of percentage deviations between the actual and expected just distributions across various geographic units and granularity levels in Greater Sydney (Fig. 1).

Conclusion

The study highlights the importance of integrating justice considerations into urban heat resilience strategies, emphasizing the concept of "organising for resilience and justice."

- The study does not commit to a specific definition of "justice" or endorse a particular theory of distributional justice.
- It suggests practical outcomes and pathways for incorporating these considerations.
- It acknowledges that other justice theories might better align with the actual distribution.
- It advocates for a more frequent and significant integration of justice considerations in the practical implementation of urban resilience strategies, responding to the need for further action in this area to effectively manage resilience and justice.

Horses, pets, livestock and landholders: collaborative, animal centred preparedness in the Hunter Region.



DON'T WAIT, PLAN NOW

Animals are central to many people's lives, and they face increasing disaster risk in a changing climate. This has resulted in animal owners putting themselves, their animals and others at risk.

Hunter Local Land Services and University of Newcastle began the Climate Smart Animal Safe Places Project in 2020. This has evolved into a strong collaboration for improved animal preparedness.

Contributors include NSW Department of Primary Industries - Rural Recovery Support Service, NSW Farmers, NSW Reconstruction Authority Landcare, local governments, business and individuals.

Using a twist on place-based resilience, this project is activating preparedness in animal focused social networks that have not usually engaged in emergency preparedness.

Major outcomes from this collaborative effort include:

1. An enhanced focus on Animal Safe Places and is at 25 Hunter Animal Safe Places, upgrades at two sites and identification of additional sites.

2. A series of communication tools: videos, posters, and a preparedness landing page

3. Trained landholders and personnel: A Plan in Your Hands workshop delivered to 200+ landholders, A Plan in Your Hands Facilitator Training & Animal Safe Place Personnel training.

4. Clarification of procedures for opening of Animal Safe Places, review of emergency communication.

5. Formation of a working group, Animal Plan Hunter, to support ongoing collaboration between community and agencies.

An indicator of success would be ongoing, scheduled preparedness activities with emergency services, informal networks and animal clubs.

Access resources, research and the Animal Plan Hunter working group at this QR code.

Contact rob.henderson@lls.nsw.gov.au, 1300 795 299

Australian Government
Manning Landcare
The University of Newcastle Australia
NSW Government
This Project received grant funding from the Australian Government

Big Map

DISASTER RELIEF AUSTRALIA

Backed by the skills and experience of military veterans, emergency services specialists and an army of dedicated volunteers, Disaster Relief Australia's Big Map empowers communities to build disaster resilience by facilitating collaboration and connection.

Thanks to collaborative efforts by Disaster Relief Australia and Kempsey Shire Council, communities in the upper Macleay River catchment of NSW at risk of severe flooding can now use the Bureau of Meteorology to check if local bridges are open or closed during an emergency event.

This was made possible by discussions had during a Big Map workshop which brought together community members with the Bureau of Meteorology and resulted in the Bureau including the bridge heights of three bridges at Bellbrook, Toorooka, and Sherwood in the Macleay River Catchment on its website's hydrographs.

Why is the Big Map unique?

Battlefield to boardroom

The Big Map is based on military wargame theory and triggers innovative discussions. This provides 'on the ground' understanding of risk and resilience strategies.

Collaboration through Big Map

Disaster Relief Australia brings together community with agencies to build resilience together.

Scan to view the Macleay River catchment flood card

Respecting Cultural Protocols in our Ways of Working

By respecting Cultural Communication and Engagement Protocols, we create a strong foundation enriched by learning, listening and sharing.

Phase Focus

Focus on nurturing a two-way relationship

Focus on shared planning and delivery

Elder led Cultural burning on Nowanup Noongar Boodja in May 2024. Photo: Robert Eades, Nowanup Rangers.

Phase 1

Due diligence

Understand people, community, culture and Country.

Phase 2

Build foundation

Foster trusting and open relationships.

Phase 3

Plan together

Navigate complexity and identify mutual benefits.

Phase 4

Deliver together

Collective delivery, knowledge sharing and two-way learning.

Phase 5

Future projects

Collaborate to identify future opportunities.

GOVERNMENT OF WESTERN AUSTRALIA

DFES Department of Fire & Emergency Services

Bushfire Centre of Excellence

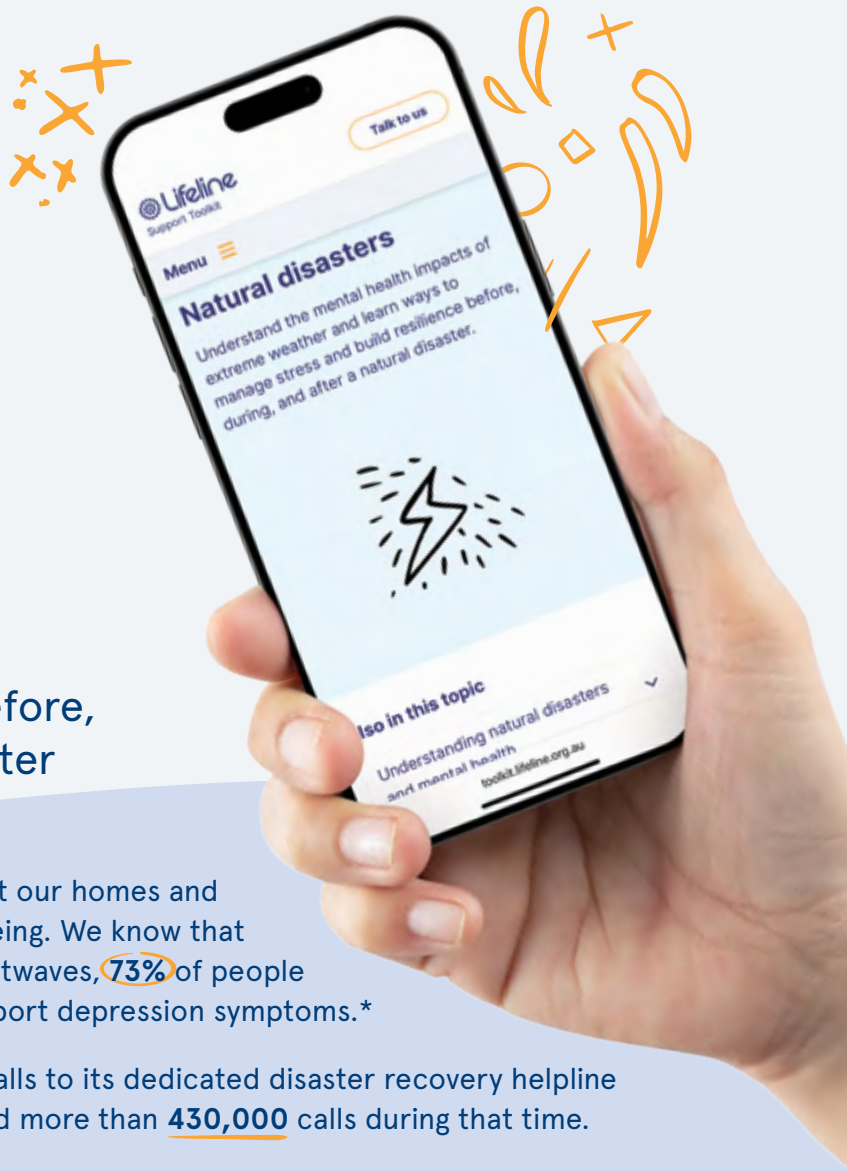
Artwork by Aunty Gloria Kearing, Bindjareb Elder

First Nation Australians are advised that this publication may contain images or names of deceased persons.

Lifeline
Together with
NRMA INSURANCE HELP NATION

Lifeline Support Toolkit

Managing your mental health before, during, and after a natural disaster



Extreme weather takes a toll on more than just our homes and communities - it also affects emotional wellbeing. We know that following events like floods, bushfires, and heatwaves, **73%** of people report feeling anxious while **49%** of people report depression symptoms.*

Lifeline Australia has seen a **25%** increase in calls to its dedicated disaster recovery helpline **13HELP** over the past three years, and received more than **430,000** calls during that time.

Common mental health impacts of extreme weather*

61%
61% of Australians experience feelings of stress or anxiety thinking about natural disasters.

50%
50% of Australians worry about having access to mental health support following extreme weather.

1-3 yrs
The emotional effects of extreme weather are typically felt for 1-3 years but can last much longer.

62%
62% of Australians say they would rely on a loved one for mental health support following extreme weather.

34%
Only a third of Australians (34%) believe communities are well equipped to deal with the mental health impacts of extreme weather events.

The Lifeline and NRMA Partnership

Lifeline Australia has partnered with NRMA Insurance, through their Help Nation initiative to create a range of online resilience resources to help Australian's mentally and emotionally prepare for and recover from extreme weather events.

The natural disasters content in Lifeline's Support Toolkit, includes:

- Practical strategies to manage stress and wellbeing during times of uncertainty.
- Tools, apps, and support services to help you build resilience and move forward.

Tips to manage your mental health

- ☑ Take action to reduce anxiety by becoming informed about weather events.
- ☑ Join a local emergency or environmental action group.
- ☑ Prioritise self-care and wellbeing through sleep, exercise, nature, and social connection.
- ☑ Reach out to Lifeline for crisis support, available 24/7 by phone, text, or online chat.

ABOUT LIFELINE

For over 60 years, Lifeline has been connecting with Australians in need through crisis support and suicide prevention services, operating the 13 11 14 telephone line within 43 centres around the nation as well as a 24/7 crisis text, webchat service and Support Toolkit. The organisation expects to respond to over one million requests for support this year, creating an average of 120 safety plans to keep a person experiencing suicidal ideation safe every day.

Visit Lifeline's Support Toolkit to learn more

*Sources: *Summary of Results From National Study of the Impact of Climate-Fuelled Disasters on the Mental Health of Australians* by the Climate Council, 2022; and *Community Recovery, Handbook 2* by the Australian Institute for Disaster Resilience, 2018.

Navigating the Flames: Understanding the Complex Interplay of Factors Influencing Householders' Self-Evacuation Decisions

Olufisayo Adedokun, Temitope Egbelakin, Thayaparan Gajendran & Willy Sher
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0 Background to the Study

ustralia is one of the regions most seriously affected by bushfires globally. Historically, the fatality rate in Australia is 1 per 21 homes estroyed by bushfire, rising to 1 per 13 homes when considering the 2009 Black Saturday event (Adedokun et al., 2023).

hese statistics underscore the significant risks bushfires pose to communities, necessitating effective self-evacuation strategies to nsure safety.

herefore, this study investigates the complex interplay of factors affecting self-evacuation decisions, aiming to inform and enhance he evacuation strategies, ultimately improving public safety and reducing fatalities during bushfire events.

0 Research Questions:

(i). What factors mostly influence householders' decisions to self-evacuate during a bushfire?
(ii). How do these factors interact to shape self-evacuation decisions?

0 Material and Methods

n inductive research approach was used, involving collection of qualitative data through semi-structured terviews to gain insights into participants views (Adedokun et al., 2024).

articipants were recruited from 3 local councils in southeast New South Wales, which was severely affected y bushfires between December 2019 and January 2020 (Fig.1).

0 respondents, who participated, provided written informed consent before the interviews.

thics Approval Number: H-2021-0284, University of Newcastle Human Research Ethics Committee.

Fig 1: Study Areas in NSW

0 Study's Findings

factors influence self-evacuation decisions (fig.2).
he factors are interconnected leading to 16 possible pair-wise interdependencies (fig.3).
hese pair-wise factors were identified as essential in shaping effective self-evacuation trategies from bushfire-prone areas, including:

- Road<-->Shelter Related
- Financial<-->Rebuilding Related
- Protection<-->Operation Related
- Attitude<-->Road Related
- Health<-->Information Related
- Operation<-->Road Related
- Shelter<-->Financial Related
- Attitude<-->Financial Related
- Information<-->Shelter Related
- Financial<-->Health Related
- Health<-->Rebuilding Related
- Health <-->Shelter Related

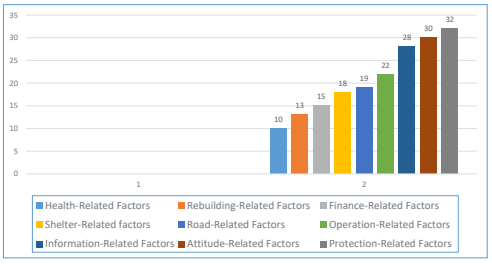


Fig 2: Factors Influencing Householders' Self-Evacuation Decisions

1• Protection<-->Attitude Related
2• Information<-->Operation Related
3• Protection<-->Information Related
4• Attitude<-->Operation Related

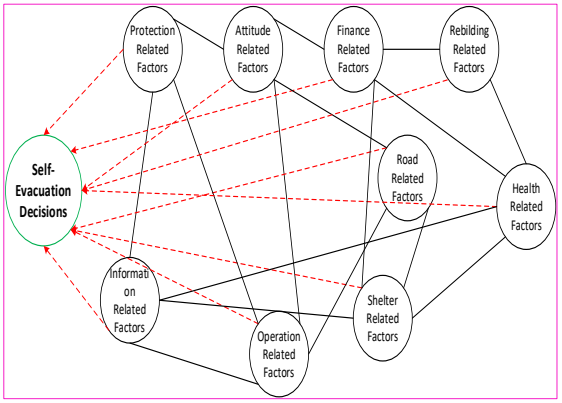


Fig 3: 16 Possible Pair-Wise Interdependencies of Factors Influencing Self-Evacuation Decisions

0 Conclusion

elf-evacuation decision-making process during bushfires is influenced by multiple interconnected factors:

- Sixteen critical pair-wise interdependencies of factors could inform effective self-evacuation strategies.
- Protective attitudes often lead householders to stay and defend rather than evacuate.
- Timely and accurate information boosts confidence, while operational challenges can create confusion.
- Road blockades and inadequate evacuation routes limit access to shelters, deterring evacuation.
- Financial constraints and rebuilding challenges discourage evacuation due to increased burdens.
- Health concerns and inadequate shelters deter householders from evacuating.
- Positive attitudes towards preparedness encourage evacuation despite financial constraints, while inadequate information and financial difficulties discourage it.

Other Relevant Publications

Adedokun, O., Egbelakin, T., Gajendran, T., & Sher, W. (2024). Incentives for self-evacuation: A panacea for bushfire fatalities in the Australian bushfire-prone areas. *International Journal of Disaster Risk Reduction, 104*, 104361. https://doi.org/10.1016/j.ijdrr.2024.104361

Adedokun, O., Egbelakin, T., Gajendran, T., & Sher, W. (2024). Why Residents Relocate to Bushfire-Prone Areas in Australia? *Australian Journal of Emergency Management (AJEM)*. https://doi.org/10.47389/39.2.34

Adedokun, O., Egbelakin, T., Sher, W. & Gajendran, T. (2024). Investigating Factors Underlying why Householders Remain in at-risk areas during Bushfire Disaster in Australia. *Heliyon*, https://doi.org/10.1016/j.heliyon.2024.e29727

Adedokun, O., Egbelakin, T., Gajendran, T., & Sher, W. (2023). Input-Process-Output of decision-making framework during bushfire. *Australian Journal of Emergency Management, 38*(4), 77 - 84.

Homeowners do not maintain their bushfire protection measures, leading to higher risk of property damage and life loss

Dr Owen Price [1] , Dr Tasmin Lara-Dilworth [1], and Catherine Ryland[1]

[1] Centre for Environmental Risk Management of Bushfires, Faculty of Science, Medicine and Health, Wollongong University

The Maintenance of Bushfire Protection Measures

The Final Report of the NSW Bushfire Inquiry (2020) recommended that the New South Wales government establish an enforcement, compliance, and education program for routine inspection of buildings to improve bushfire protection. This research explores the motivations and barriers towards achieving such a program and the potential benefits for ongoing bushfire protection.

The research

What is the best approach to encouraging better rates of ongoing maintenance for bushfire protection?

The research focusses on the importance of ongoing property maintenance in bushfire protection, based on evidence of property damage and destruction from numerous bushfire events. It highlights the role of land use planning and building standards in regulating bushfire protection both up to and beyond development consent.

The study recognises the use of motivational theory in developing a conceptual framework for understanding the barriers and motivators for achieving ongoing compliance and tests these theories through interviews with agencies and homeowners.

Views of agencies

The agency interviews revealed a consensus on the criticality of long-term maintenance for bushfire protection measures. Reasons cited include inadequate enforcement due to resource constraints among councils. Complexity in understanding and fulfilling development consent conditions was also noted, along with a perception that compliance is often disregarded post-approval. Concerns were raised about the efficacy of current regulatory frameworks and the DA process itself, with varying opinions regarding their impact on risk awareness and mitigation. Suggestions for improvement included establishing effective enforcement mechanisms, enhancing public education with tools like fact sheets and simulations, and potentially revising planning certificates to better inform homeowners. Financial incentives such as council rate reductions and government rebates were proposed. Overall, the interviews highlighted systemic challenges and diverse perspectives on enhancing long-term bushfire preparedness and compliance.

Views of homeowners

- There are varying levels of understanding of the levels of bushfire risk to individual properties and whole communities.
- People generally state that they do carry out property maintenance for the purposes of bushfire protection.
- Most respondents were ill informed regarding their conditions of development consent for bushfire protection, including the need for ongoing maintenance of an asset protection zone.
- Many were very aware of the actions of their neighbours, mostly in relation to the risk presented to their own property from neighbours not keeping the fuel loads low enough.
- Many people stated that they have subfloors and store flammable items inside them.
- Most people are insured for bushfire impact, but they are not sure of the level of insurance.
- Community events were not well attended, it was generally felt that the information provided at such events was not helpful.
- Two people loved the bushfire shutters and would be happy to receive funding to replicate around the rest of the house!
- Homeowners were particularly motivated to have some sort of sprinkler or irrigation system for bushfire protection, although the cost was seen to be prohibitive.

Further information

For additional information scan the QR code or contact:

Catherine Ryland, PhD Candidate, University of Wollongong

cjr130@uowmail.edu.au

THEORY WILL ONLY TAKE YOU SO FAR...

A BEHAVIOUR CHANGE LENS FOR COMMUNITY ENGAGEMENT

The redevelopment of the Fire Safety Planning program

THE GOAL

SHARED RESPONSIBILITY

THE CHALLENGE

'WAIT AND SEE'

Decision-making

Person-centred conversations

- Delayed decision-making in up to 50% of cases
- Lack of planning, household discussion and collaborative decision making *(Strahan and Gilbert, 2021)*

THE DESIGN MODEL

CUSTOMER-CENTRIC

This model of human-centred design ensures CFA programs are tailored, targeted, relevant and meet the needs of the users.

THE REVIEW JOURNEY

2021 - STARTING POINT

EMPATHISE
- Evaluation of existing program
- Establish consultative groups

2022

IDEATE
Co-design workshops

2023

PROTOTYPE
CFA and community testing

2024 - WHERE ARE WE NOW?

PROGRAM RELEASE
- Delivery across Victoria ahead of summer
- Training of program presenters
- Monitoring and evaluation plan including participant follow-up

RESOURCES

SIMPLE AND INTERACTIVE

TESTING AND LEARNING

CONTINUOUS IMPROVEMENT

Want to know more? Please get in touch

Elissa Jans
Engagement Advisor - Program Development
elissa.jans@cfa.vic.gov.au 0438 001 281

hi neighbours

Promoting community connection among apartment residents

Context

In Willoughby City located on Sydney's lower North Shore, 43% of residents live in high density dwellings compared to 27% across Sydney.

Council's *Community Wellbeing Survey (2021)* found poorer outcomes for social connection among apartment residents compared to those living in houses.

Apartment residents were:

- Less likely to provide help to their friends and neighbours (69%) compared to those living in houses (88%).
- Less likely to participate in volunteering (39%) compared to those living in houses (63%).
- Less likely to participate in social groups (56%) compared to those living in houses (75%).
- Provided higher ratings of loneliness compared to those living in houses.

Pilot project

- 2 pilot sites were selected in Chatswood CBD: Bentleigh apartments (200 units), Metro Towers (550 units/3 buildings).
- 'Meet Your Neighbours' events were hosted at each site to engage with residents.
- Resident volunteers were recruited. They began meeting, conducted asset mapping, and brainstormed ideas for resident-led activities.

Resident-led activities

- Neighbours BBQs
- Cultural celebrations
- High-rise Halloween trick or treating
- Kids games days

Outcomes

Within the 6 month pilot period, residents delivered:

- 15 resident-led activities.
- Over 700 cumulative participants.
- Established digital communication networks (e.g. WhatsApp groups, Facebook groups).

Participants reported making meaningful connections with neighbours and increased sense of community within their building.

Learnings and reflections

- There is no 'one size fits all' approach, as each apartment is a unique community context.
- Allow room for trial and error and encourage residents to learn as they go.
- Building and strata management are key stakeholders. Permission and support to implement activities is crucial.

Toolkit

A toolkit resource aimed at residents and building managers was developed in collaboration with Lane Cove Council, including a digital booklet and accompanying templates.

Access the toolkit here

Opportunities

High density residential settings are untapped opportunities to build social connection, cohesion and trust among residents.

There is increasing attention from metropolitan councils, state government bodies and strata organisations toward fostering resilience in apartment communities.

Contact

Susan Chen
02 9777 7592 | susan.chen@willoughby.nsw.gov.au

This project was funded by the NSW Department of Premier and Cabinet and delivered in partnership with Lane Cove Council.

WILLOUGHBY CITY COUNCIL
City of Diversity

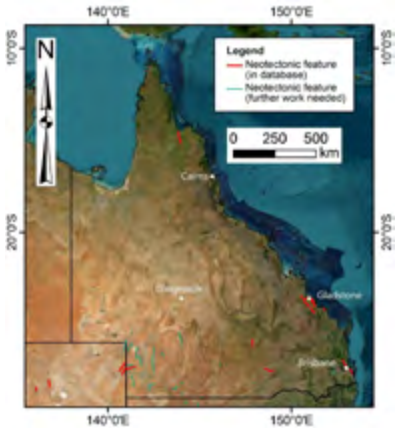
Respect Integrity Courage Loyalty Trust

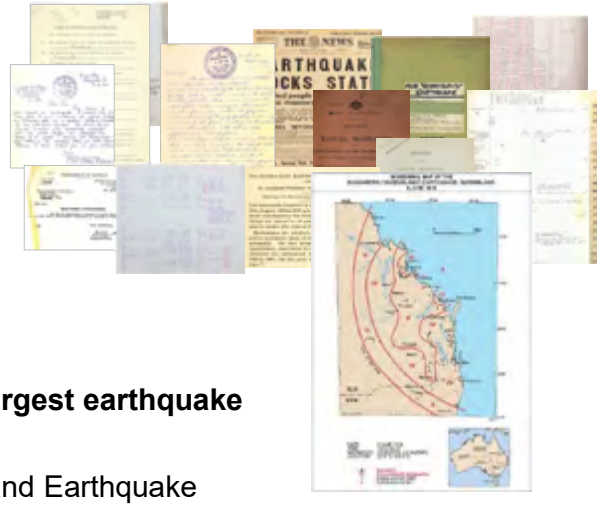
Are we ready for the next big shake: integrating new research for improved decision making

New research into earthquake hazard in Queensland is enhancing intelligence and planning capabilities for the Queensland Fire Department.

Understanding the hazard → Hindsight

Are there larger earthquakes in our past?





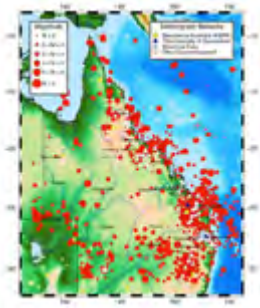
Re-evaluation of the largest earthquake in eastern Australia

- 1918 Great Queensland Earthquake

What is the risk? → Insight

The highest risk region in Queensland is from Gladstone to the NSW border. Applying PESTEL

- Political: Investment in renewable energy.
- Economic: The region provides 60% of state economic activity.
- Social: Regional towns and cities have a population of older buildings vulnerable to earthquakes,
- Technological: Dependency of critical infrastructure.
- Environmental: Historic record of earthquakes.



1968 Tennant Creek

1989 Newcastle, NSW

2021 Mansfield, VIC

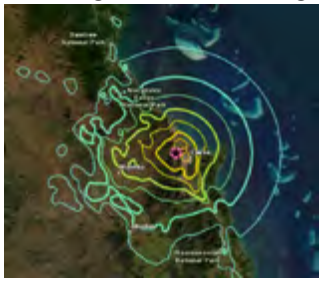
1968 Meckering, WA

How to prepare → Foresight

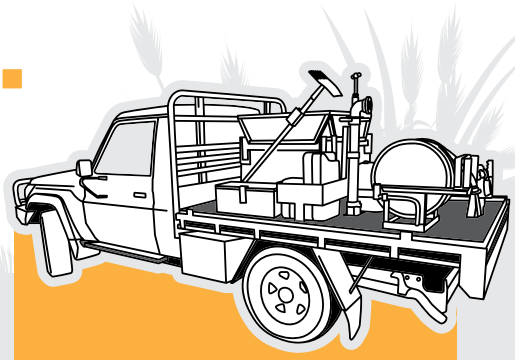
Scenarios for technical rescue capability planning and exercising.

Database of unreinforced masonry buildings for 12 Queensland locations.

INSARAG



PREPARE. COMMUNICATE. INTEGRATE.



Strengthening our partnership with farming communities

For many generations, farmers and their private farm fire units have worked alongside RFS brigades to mitigate the risk of fire across the landscape and as a critical support in firefighting efforts. Partnering with our farming communities through the Farm Fire Unit project, the RFS has made a commitment to strengthen relationships with these communities, building a shared understanding of risk, response plans and capability. Effective engagement with farming communities is critical in achieving this and can be guided by three principles: Prepare. Communicate. Integrate.

How did we get here?

The 2017 Sir Ivan Fire and subsequent 2019/20 Black Summer bush fires resulted in extensive damage in many rural areas, including the loss of residential properties, crops, livestock, farm infrastructure, pastures and bushland. These losses, coupled with ongoing community and landholder concerns and declining engagement with the RFS, culminated in increasingly strained relations between landholders, communities and the RFS.

With much work to be done, a commitment was made by the RFS to strengthen and rebuild these relationships and a collaborative initiative was developed – the Farm Fire Unit project. This project has seen RFS volunteer members and staff form a strong working partnership with the NSW Farmers' Association to guide the relationship between farmers and the RFS into the future. Working together, we have delivered a way for RFS brigades and farmers to rebuild relationships and foster improved communication with local districts and communities.

Local initiatives

There has been significant work done to engage with affected rural communities and farmers through locally led initiatives such as on-farm musters, bush fire risk management planning and pre-incident planning. Through the Farm Fire Unit project, stakeholders on all sides have benefited from an improved understanding of how to work better together before a fire and how to communicate and prioritise asset protection on the fireground.

Strong and trusting relationships with our farming communities are essential for the ongoing safety and the future of volunteering in these communities.

For more information on Farm Fire Units visit www.rfs.nsw.gov.au/farmers, contact your local fire control centre or scan this QR code for the operational guide:

PREPARE

Preparation extends beyond the maintenance of firefighting equipment and property preparations and emphasises the importance of effective engagement between brigades, RFS districts and farming communities prior to a fire emergency. Showing up together for authentic, collaborative and transparent conversations is key to building a meaningful presence and developing an understanding of relevant capability and property preparedness. Building a shared appreciation of farmers' capabilities and equipment results in us working better together to provide improved solutions and outcomes when an emergency strikes.

COMMUNICATE

We know that open and consistent communication is valued by our rural communities and is essential both on and off the fireground. Effective communication is critical for the safety of everyone when working cooperatively on the fireground and equally important for the effective transfer of local knowledge. Prioritising communication in all interactions with rural communities ensures a respectful and collaborative working relationship is maintained year-round and will ultimately benefit firefighting operations.

INTEGRATE

Recognising and appreciating our farmers' experience and understanding of their own assets and properties is critical to effectively integrating and building capability within our rural communities and brigades. Together, farming communities and the RFS can prevent and manage fire in a safe and coordinated way. By collaborating on a plan and genuinely sharing information and experiences, farmers and RFS members can integrate effectively to achieve our shared goals.

Nat CORR National Centre for OUTDOOR RISK & READINESS

OUTWARD BOUND AUSTRALIA EST 1964

Walk with us for change

THE MISSION

NatCORR is a collaborative initiative by Outward Bound Australia for outdoor practitioners across the country.

We aim to build capability to predict, prepare for, mitigate and respond to events to be safer in a rapidly changing climate.

WEATHER IMPACT

NatCORR has done extensive industry consultation to understand the impacts of changing weather patterns on the outdoor industry. The Weather Survey was vital in understanding exactly how the outdoor industry reacts and responds to changing weather.

As our bushfire seasons are predicted to grow longer, and our ski seasons grow shorter, the outdoor industry is disproportionally affected. Having strategic plans and training to adapt and respond to changing weather is vital. NatCORR is now in consultation with the Bureau of Meteorology to create and offer training and resources in this space.

THE FUTURE

This means that all Australians and visitors, wherever they live and whatever their age, ability and cultural background are able to enjoy and benefit from being in the outdoors and feel safe in doing so.

Join us in making outdoor adventures in Australia, safer in the face of a rapidly changing climate.

ORI HEAT

ORI, or Outdoor Risk Intelligence, is made up of two parts. First is ORI HEAT, a new heat forecasting & risk management tool developed with EMU Systems™. Heat has claimed more lives in Australia than any other natural hazard. For people who work outside, the risk is higher.

This tool gives a heat stress rating score with hourly risk forecasts for 72 hours, and projections up to 7 days, specifically for outdoor activities. These heat stress scores are aligned with risk mitigation advice and decision support, enabling an evidence-based rationale for managing heat in the outdoors.

ORI TRACK

The second part is ORI TRACK, an AI interfaced incident reporting and tracking tool for capturing information about outdoor incidents and business continuity disruption. Developed with BrainstormIT™, ORI TRACK sits within a privacy compliant construct, allowing sector wide benchmarking with BI dashboards to help organisations understand their risk profile and improve risk mitigation practices.

This app will allow for outdoor incidents to be automatically synced with their location and current weather. AI enabled user interfaces maximise ease of data uploading and integration with existing risk and reporting systems and methods. This will include de-identified data API links with existing incident / risk reporting platforms, and AI uploading of paper based or verbal reports.

RISK MANAGEMENT AND INCIDENT RESPONSE

The NatCORR's Incident Response Workshops are delivered by internationally renowned expert, Dr Clare Dallat. These workshops were born from the outdoor industry's need for critical incident response planning.

Topics include emergency management planning, physiological response to incidents and how to prepare for the unexpected. These are vital in NatCORR's multi-pronged approach to increase the outdoor industry's capability during severe weather events.

NATCORR HUB FOR INNOVATION

We are also building a communal centre as a physical home for NatCORR, where networks can gather and learning and problem solving can take place.

Artwork created by the incredible Ya Reeves

To find out more about this initiative, visit:
NATCORR.ORG.AU
We want to hear from you! natcorr@outwardbound.org.au

Australian Government

This project received grant funding from the Australian Government

Lessons and Continous Improvement: Providing a blueprint for an uncertain future

What are lessons?

Lessons can be derived from any activity. They can be a product of events, exercises, training, experiments or day-to-day work. During the course of our activities, most of us will recognise ways of doing things better or more efficiently, and ways that we can pass this information on to our colleagues and successors to help them improve and avoid problems.

Lessons management is an overarching term that refers to collecting, analysing, disseminating and applying learning experiences from events, exercises, programs and reviews. Australia's safety and security depends on our collective ability to learn from experience, manage the knowledge gained and develop learning organisations that can adapt to deal with current, emerging and unexpected threats.

Learning lessons leads to improved operational effectiveness, reduced operational risk and increased cost efficiency. Consistent approaches to lessons management will encourage adaptability and flexibility across sectors, and sharing of knowledge and experiences will assist with ongoing continuous improvement of people and organisations.

Lessons Management

Lessons offer a blue print for Australia's uncertain future where consecutive, concurrent and compounding hazards as well as novel risks are creating an increasingly complex operating environment. Including lessons in an organisation's operating model, cements a commitment and culture focused on continuous improvement.

Lessons provide a framework to review current capabilities, ensuring they are fit-for-purpose for current and future hazards and risks. Creating a practice of recording observations and insights from exercising and operations provides data that can be worked into lessons identified. NEMA incorporates knowledge and lessons identified from existing preparedness capabilities to inform future planning, investment and engagement with stakeholders

A credible lessons management process also supports business planning, organisational culture and staff engagement – drawing in horizontal and vertical knowledge. Lessons build organisational resilience by creating a foundation for a more adaptable organisation that is focused on its core mission with a shared knowledge and evidence base to support future flexibility and decision making

Failure to identify lessons means that NEMA, the Australian Government and states and territories are unprepared for novel and emerging risks.

Changing operating environment

Our environment is rapidly changing. The 2023 Intergenerational Report (IGR) considers five of these major forces: an ageing population; technological and digital transformation; climate change and the net zero transformation; rising demand for care and support services; and geopolitical risk and fragmentation. This – coupled with more frequent, more intense disaster events and the consecutive, concurrent and compounding effects of these risks intersecting – means that Australia faces a challenging future that Australia's emergency management system needs to operate in.

With a changing operating environment, the lessons system must also adapt. The success factor in this environment is not how many lessons were identified and fully implemented in a post-hoc review, but how quickly emergency managers made sense of the situation; the speed to action and how quickly they identified and prioritised the critical areas in the system that needed to be stabilised; the speed to decision to clearly articulate the lines of effort that were required to mitigate and stabilise the situation; and finally, how effectively they communicated.

While disasters are complex, what the community wants to know remains the same. They want to hear: what we know; what we do not know; what we are doing to mitigate the risks we have identified; what we want others to do; and what our communication tempo will be. Using this information as our guide, and finding multiples channels, repeatedly, to communicate with the public will maintain public trust in the system and will be another measure of our success.

The lessons system therefore needs to be dynamic, adaptable and should operate using near-real time methodology, allowing rapid changes to be incrementally made within the system, and ensuring change that is in the public interest is immediately realised.

NEMA's approach to Lessons Management

NEMA fosters collaboration, inclusivity, and adaptability for lessons on a national scale, charting a collective course towards more effective problem-solving that will position Australia to better prepare for, respond to and recover from disasters today and into the future.

NEMA utilises the OILL Methodology to synthesise observations and identifying lessons (observation – insight – lesson identified – lesson learned). NEMA has been working to introduce near-real time evaluation throughout our exercise program and crisis operations. Collecting lessons as close to an event allows an organisation to make 'micro adjustments' or course corrections while an event is unfolding.

Strategic Observations and Insights

To identify national level strategic insights, NEMA conducts After Action Reviews with all stakeholders who have had a role, or been impacted during an event. Through meaningful collaboration, NEMA fosters communication and collects observations. NEMA seeks to hold these conversations in a timely manner to allow for micro changes before the next disaster. NEMA has adapted OILL methodology to synthesise Observations into Insights which can be relevant for all states and territories. NEMA seeks to ensure that these insights are distributed with all states and territories in order to ensure that lessons are being shared nationally.

NEMA's near-real time lessons focuses on strategic observations and insights ('SOI') – with a the aim of ensuring speed to insight and generating shared awareness. SOI builds on complex systems of systems thinking that underpins other national institutions like the National Coordination Mechanism.

Establishing and supporting a shared national lessons practice, offers exponential transformation across Australia's crisis management architecture. Agencies are encourage to use the OILL methodology as the foundation for their lessons approach, but adapt to the needs of their agency.

As a nation we are interconnected and must face the challenges of disasters in coordination and cooperation. Lessons provide an opportunity to bring everyone together to contribute to a national conversation about what has worked well and where there are opportunities for improvement in the future. NEMA's approach fosters a culture of adaptability, enabling swift preparedness and response to novel and emerging risks

NEMA utilises a range of mechanisms to conduct lessons processes. The National Coordination Mechanism (NCM) provides an opportunity for identifying and informally sharing real-ti me lessons across agencies nationally.

What is the difference between 'lesson identified' and 'lesson learned'?

Lessons learned embodies two interrelated concepts: the identification of the lesson (lesson identified), and the learning (lesson learned), or change that results. Identifying a lesson does not automatically mean it will be learned.

A lesson identified articulates a positive or negative experience and a clear course of action based on analysis. A lesson learned articulates how a lesson identified has been learned through a demonstrated change in behaviour. Essentially a closing of the learning loop as it relates to a specific lesson.

Inability to learn lessons

The term 'lessons learned' is sometimes used to describe raw observations or opinions without any validation or analysis, and therefore is not well understood and is often misused. This results in significant perception and expectation management problems. Not all issues that emerge during and after operations and exercises are 'lessons' that can be 'learned.' These are sometimes referred to as 'wicked problems', or problems that are complex or compounded.

Reoccurring themes often emerge following each major national disaster – systems are not adopting the lessons identified and transforming them into lessons learned. Challenges come from complex operating environments, difficulties changing internal cultures and processes and the risk that changes will only present new problems to be solved.

There is much to be learned from establishing a lessons and continuous improvement culture within organisations. This approach will foster a more collaborative environment to share lessons at the national level, Australia is better prepare for, respond to and recover from disasters. More agile organisations with higher staff engagement will be better placed to truly learn lessons

Nationally, we should be prepared to talk about our successes and opportunities for further improvement to cement a culture we are prepared to tackle new challenges with new approaches. Rather than running from the complexity of the challenges that are ahead, we should commit to shared situational awareness, open dialogue on continuous improvement and engagement across our whole-of-nation system.

National Lessons Practice

Cementing national lessons practices offers a transformative paradigm for addressing challenges through collective problem-solving. By analysing the effective management of lessons through a national lens, a blueprint emerges for fostering collaboration, innovation, and resilience across the national system.

The emphasis on inclusivity within national lessons management practices serves as a cornerstone. Encouraging diverse perspectives ensures a comprehensive understanding of complex issues, paving the way for holistic solutions. The benefits of sharing lessons nationally promises breakthroughs in tackling interconnected problems.

To discuss Lessons Management at the National Emergency Management Agency contact **EMRLessons@NEMA.gov.au**

NEMA Facilitated After Action Review of Australian Warning System implementation in Queensland

Background

On 30 December 2023 Senator the Hon MurrayWatt tasked NEMA with bringing the Bureau of Meteorology (the Bureau), Queensland governments and councils together to look for continuous improvement opportunities following implementation of the Australian Warning System (AWS).

Scope

The AAR explored warnings and events which occurred before and during Tropical Cyclone Jasper and the severe weather that followed (13 –28December2023); and South East Queensland Severe Storms (25December2023 –4January2024).

Method

NEMA utilises OILL Methodology (Observation, Insights, Lessons Identified, Lessons Learned) with a focus on sharing experience and identifying opportunities for continuous improvement.

Insights

Greater alignment of weather warnings
Weather warnings are likely to be more effective in triggering protective community actions if there is a greater understanding of the various roles played by Australian Government, state and local agencies in issuing warning products. Insight analysis indicates there are opportunities to enhance awareness of the various warnings and who is responsiblefor issuing them in order to assist with the initiation, synchronisation and sequencing of warnings across the emergency management continuum. The Australian Warning System (AWS) has been developed and agreed nationally, to provide a consistent approach to warnings during emergencies such as bushfire, flood, cyclone, storm, flood and extreme heat. The AWS provides a framework to align warning across all hazards and provides consistency for call to action for the three level of warnings and consistent set of icons.

Timing and sequencing of emergency warnings
Queensland disaster management arrangements are most effective when state, district and local council's actions are synchronisedand appropriately sequenced. Insight analysis identified that there were occasions where emergency managers were uncertain about the sequence of warnings and approval processes. Australian Fire and Emergency services aim to provide the public with timely and relevant information during emergencies.

Emergency management sector education on warnings
Public trust and confidence in emergency management institutions is upheld when reliable and timely warnings are issued. Issuingweather warnings is the responsibility of the Bureau of Meteorology and Australian Warning System notifications are the responsibility of Queensland state and local governments. Insight analysis identified the need for additional training to increase education and familiarisation with warning products and processes to enable speed to action.

Communication and comprehension of warnings
Weather warnings need to be easily comprehended by the public in stressful or uncertain circumstances. The text and graphics/mapping of warnings should provide clear and easy to understand information to support individuals to make informed decisions. Weather warnings need to be easily translatable by communities who may not easily comprehend complexor technical information.

Community expectations
Community expectations of warnings continue to increase with the presence of social media, access to technology and the frequency of updates, public information and notifications during the COVID-19 pandemic. Observations analysis identified that more effort is required by all organisations involved in issuing warnings to build community awareness and understanding of warnings systems and processes, their limitations, and where and how the community can access warning information from trusted sources.

Lessons Management Cycle

Timeline

Overview of lessons management process conducted by NEMA

30 Dec — **Announcement** — Minister announces review

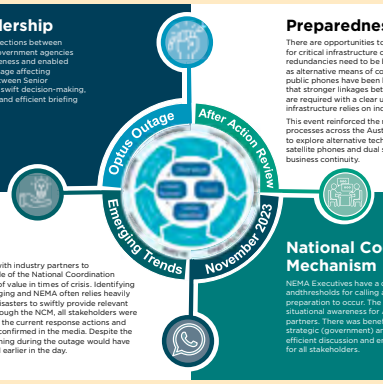
08 Feb — **AAR Conducted** — AAR conducted in Queensland

1 Mar — **Validated** — NEMA validated analysis with Queensland officials

12 April — **Finalised** — NEMA provided report to Minister

Coordinated Leadership

Observations indicate the strong connections between Senior Executives across Australian Government agencies allowed for enhanced situational awareness and enabled rapid decision making. Despite the outage affecting connectivity, proactive discussions between Senior Executive in lead agencies allowed for swift decision-making, coordinated cross government action and efficient briefing of Federal Ministers.



Preparedness

There are opportunities to enhance Australia's preparedness for critical infrastructure outages. Observations indicate that redundancies need to be built in tandem with resilience initiatives, as alternative means of communication such as land lines and public phones have been largely retired. It was also highlighted that stronger linkages between Australian Government and industry are required with a clear understanding of how government infrastructure relies on industry providers.

This event reinforced the need for greater business continuity processes across the Australian Government. There are opportunities to explore alternative technological options such as utilisation of satellite phones and dual sim cards for critical roles to ensure business continuity.

Speed to Action

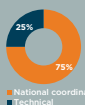
Opportunities exist to better engage with industry partners to ensure a clear understanding of the role of the National Coordination Mechanism (NCM), and how it can be of value in times of crisis. Identifying stakeholders prior to a crisis is challenging and NEMA often relies heavily on external agencies for non-natural disasters to swiftly provide relevant contacts to attend NCM meetings. Through the NCM, all stakeholders were able to gain a strong understanding of the current response actions and seek clarity on matters which were unconfirmed in the media. Despite the NCM being the correct platform, its timing during the outage would have been more effective if it had been held earlier in the day.

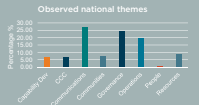
National Coordination Mechanism

NEMA Executives have a clear understanding of risk tolerances andthresholds for calling a NCM meeting. This enabled proactive preparation to occur. The NCM was successful in enhancing situational awareness for Australian Government and industry partners. There was benefit holding two NCM streams: strategic (government) and technical (industry), as it enabled efficient discussion and ensured effective information sharing for all stakeholders.

Exercise Aurora observations

986
A total of 986 observations have been collected as at 3:30pm 23 May 2024.





Exercise insights

Consistency of public communication from government and industry partners is vital to support the community to make informed decisions. Public communication should be timely, clear and concise to support preparedness. Consideration needs to be given to high risk communities to ensure information can be easily comprehended in stressful or uncertain circumstances.

Emergency management and business continuity plans need to be developed or reviewed and further enhanced to encompass a severe space weather event. Plans need to ensure government and industry partners can effectively manage, respond to and recover from the impacts of severe space weather.

Participant Comments

COMMUNITY-CENTRED LESSONS MANAGEMENT: LEARNING FOR COMMUNITY RESILIENCE

FIRE to FLOURISH
Strength through community-led action

Tenterfield Aerodrome: community-run and critical for fire suppression.

Roadside vegetation burnt during bushfire, adding to the current fuel load.

AUTHORS

Dr Adriana Keating, Fire to Flourish, Monash University
Dr Zoe D'Arcy, Fire to Flourish, Monash University
Aunty Helen Duroux, Fire to Flourish Tenterfield
Mr Matt Sing, Fire to Flourish Tenterfield

SPECIAL THANKS

Many thanks to the Tenterfield community for contributing your insights. Particular thanks to Sharon Tierney (TAFE NSW), Josh Moylan, Gina Carpenter, Wendy Skilbeck, Chrissy McLatchey (CWA), Scott Mack (RFS) and Rob Evans (FOTA).

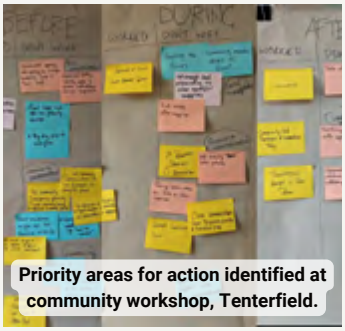
WHAT WE DID

Following a devastating bushfire in late October 2023, Tenterfield (NSW) community members asked Fire to Flourish to help them identify lessons that could be learnt from the event. We convened a group of Community Advisors to guide the post-event review, and conducted community interviews and focus groups to hear what worked well and what needs to be improved before the next disaster.

HOW DID WE DO IT?

We adapted the Post-Event Review Capability method to be more community-centred. In addition to reviewing RFS mapping, media and social media commentary on the bushfires, we conducted four community workshops, 16 community interviews and two on-site visits.

With community members, we explored strengths and gaps before, during and after the bushfires. We did not focus on fire suppression operations; we focused on the role of community in risk reduction, preparedness, response and recovery. We were careful not to point fingers. Instead, we identified actionable priorities for strengthening resilience.



Priority areas for action identified at community workshop, Tenterfield.

WHAT HAVE WE LEARNED?

RESILIENCE PRIORITIES IN TENTERFIELD

Tenterfield has a strong foundation of community connectedness and active community-based organisations. Community-identified priorities include:

- High demand across the community for more concerted and connected efforts in fuel management, including working with Traditional Owners to explore cultural burning.
- More coordination between organisations involved in supporting community evacuation and recovery.
- Community needs a seat (or seats!) at the table when decisions are made about disaster recovery priorities.
- Attracting and retaining active volunteers poses a challenge and opportunity for the future.

COMMUNITY-CENTRED LESSONS MANAGEMENT

- Communities are willing and eager to reflect, learn and act on lessons.
- When working with community, it is important to lead with the fact that a learning review will not point fingers at, or blame, individuals or organisations.
- Communities know their system best; outsiders can't predict community priorities. However, outsiders can create the space for frank reflections needed.

"We can't keep doing the things we've been doing for years. We have to change the way we're doing it. We need to involve the community more to reduce the risk."
TENTERFIELD COMMUNITY ADVISOR

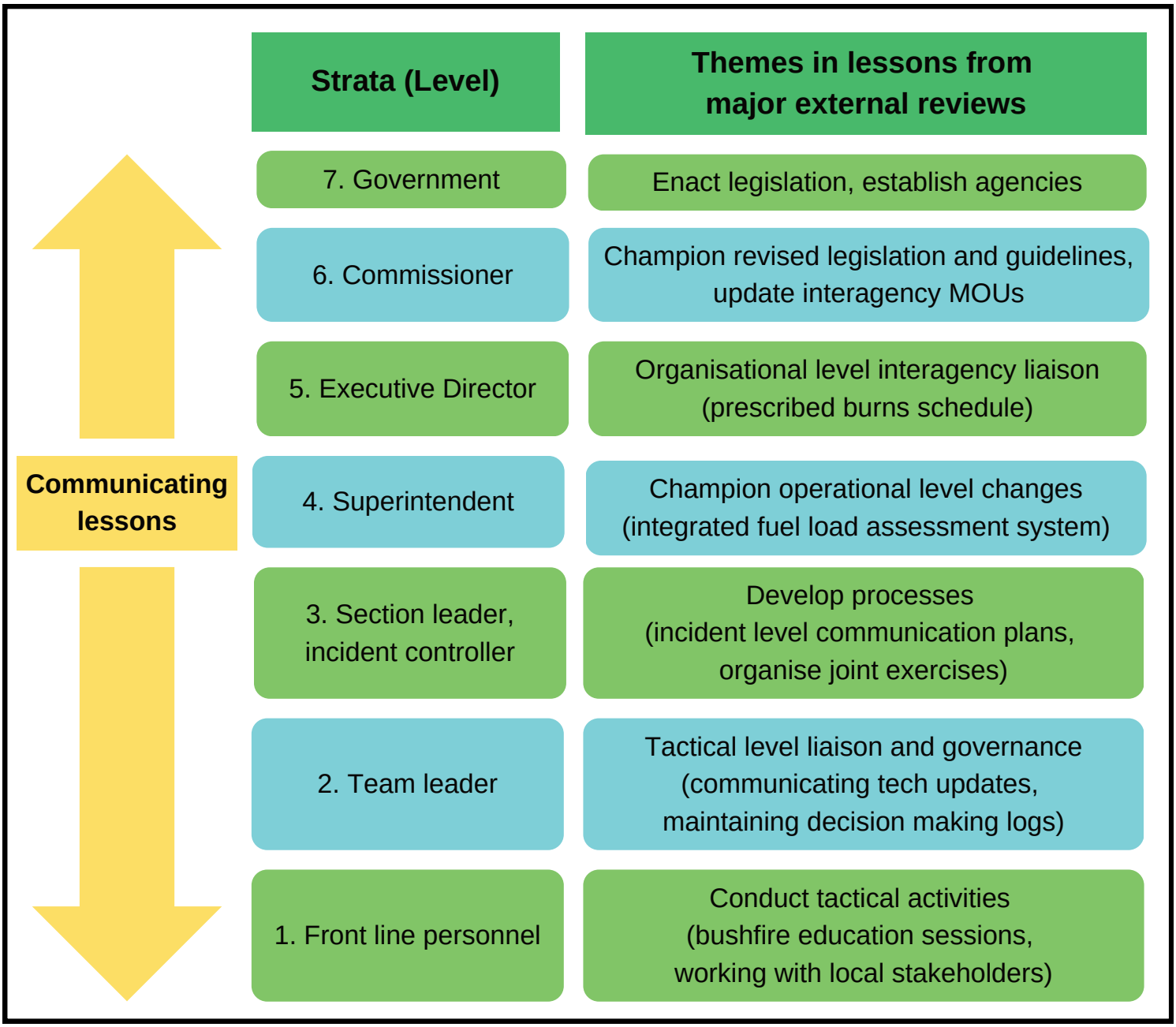
LEARN MORE

Fire to Flourish is led by Monash University, with cornerstone investment from philanthropic partners, the Paul Ramsay Foundation and Metal Manufactures Pty Ltd. Additional philanthropic funding is provided by the Lowy Foundation.

MONASH University | MONASH SUSTAINABLE DEVELOPMENT INSTITUTE | paul ramsay FOUNDATION PARTNERSHIPS FOR POTENTIAL | ELECTRICAL MERCHANDISING | THE AUSTRALIAN CENTRE FOR SOCIAL INNOVATION

Impact of organisational strata on lessons management in the WA emergency services sector

Study research question: Does the strata of work present barriers to the lessons management process in WA emergency services organisations?



Jennifer Medbury
Lecturer - Intelligence and Security
PhD candidate
Edith Cowan University
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Next phase of research:
Focus groups on specific barriers that exist at and/or between strata

Measurement Evaluation & Learning (MEL) Report: Improving Community Disaster Risk Reduction Engagement Activities

Emma Davis and Michelle Bouvet, NSW SES

Measuring the value and impact of community disaster risk reduction work is recognised as notoriously difficult.
The NSW SES Measurement Evaluation & Learning (MEL) Business Intelligence (BI) Report is designed to provide a robust, holistic and common methodology to measure, evaluate and improve these activities.

Background

The MEL Framework was developed by the NSW SES Community Capability team. It outlines the outcomes & expected impact that will be achieved through community engagement activities. The Framework has three pillars: Our Organisation, Our Community, Our Impact.

The MEL BI report is based on the Framework - data is grouped by the 3 pillars & represented in visuals that users can interact with to gain insights.

Our Organisation

Inputs, Activities and Outputs
- What are we doing?
- How many people are doing it?
- How much are we spending on it (time and money)?

Structure and Culture
- What is our organisational structure?
- How are we focused on Community Engagement?

Funding
- How are our activities funded?
- Is the funding sustainable?
- What are we doing?

Our Community

Community Profile
- What is the community profile (demographics, vulnerability, English as a Second Language)?
- What is the inherent risk profile for this community (flood, storm, tsunami)?

Community Resilience
- What is the community's level of resilience?

NSW SES Relationship
- What is the nature/quality of our relationships with this community?

Our Impact

Outcome Measurement
- What outcomes are we collecting data on in the community?

Impact
- What the community perception of our activities (awareness, knowledge, trust, resilience, action)?
- What is the impact of our Community Engagement activities (awareness, knowledge, trust, resilience, action)?

- User friendly intuitive tool available to all members
- State-wide evidence-based data from multiple sources in one place/tool
- Supports members to target programs and information
- Helps determine which engagement activities have the greatest mpact
- How and why our community activities make a difference
- Self-service business intelligence (reducing the reliance on individual team members)
- Monitor and share impact of Community Engagement Work

Key Considerations & Challenges:

- Differing spatial boundaries & data granularity: authorative vs organisational vs other external
- Currency / accuracy of data
- Common attributes / fields to enable data joins
- Data collection & maintenance
- Many data sources (over 10) : refresh & input
- Focus of the tool and users (community - state)
- End user data literacy

Outcomes

- ✓ To present appropriate, validated data to key stakeholders across the agency
- ✓ Close the loop for volunteers and staff on the utility of robust and regular data collection and analysis to inform decision making
- ✓ Visual, scalable and replicable methodology for asessing exposure and mapping risk mitigation effort across the agency

Learnings:

- Opportunity to improve / refine data
- Fit for purpose data collection to help answer key questions
- Documentation of business rules and decisions
- Advocates for prioritization of work and funding

CREATING SAFER, MORE RESILIENT COMMUNITIES

BECAUSE the less prepared individuals and communities are the greater the impact of an emergency
WE support them to plan, prepare, respond and recover from emergencies
SO they are more resilient and there is reduced risk to loss of life, serious physical or psychological injury and damge to property

Member Testimonials

"it will enable us to pick more strategically the locations for our events and also shows us where our flood risks are so we can plan community engagement"

-Emily, NSW SES Moruya Unit

"maybe we need to concentrate on some preparedness around storms. We know also in Eurobodalla that our age group is older, so we have to cater for that. And this report highlights all that".

- Jacklyn, NSW SES Batemans Bay Unit

Not one-size fits all

How to evaluate the **impact of community engagement in risk reduction?**

A LITERATURE REVIEW

Increasingly, people working in the emergency sector are debating the best methods and indicators for evaluating community engagement designed for risk reduction.

How can we get the evidence we need to assess the impact of our community engagement initiatives? How can we determine what works, in what circumstances and why?

CFA recognised the need to build capacity to evaluate the impact of its community engagement efforts.

What **indicators** are appropriate?

What **methods** are appropriate?

Impact evaluation is a contested term

Different agencies use different definitions.

No one set of common indicators applies

Each community engagement intervention requires tailored indicators to effectively measure impact.

There are many approaches

There are different types of impact evaluation questions and relevant methods.

Choose wisely

The choice of appropriate design, methods and indicators for impact evaluation will involve a range of considerations.

DATA	APPROACH
Australian Research = limited	Literature review +
International insights = extensive	Expert panel engagement

Author: Dr Ken Strahan, Strahan Research Pty Ltd

Acknowledgements: This project was completed with the assistance of Dr Barbara Ryan, Professor Maureen Taylor, Professor Kim Johnston, Associate Professor Brad Astbury, Dr Mel Taylor, Anthony Bradstreet, Dr Debra Hopkins, John Gilbert, Lucy Saaroni, Danielle Teychenne, Louise Collins and Patrice Higgins

Contact: Patrice Higgins | Patrice.Higgins@cfa.vic.gov.au

NSW Department of Primary Industries and Regional Development's Lessons Management Framework for Enhanced Emergency Response

Department of Primary Industries and Regional Development

Alex Murray[1], Steve Eastwood[1], Leigh J. Pilkington[1*]

A Strategic Approach

The NSW Department of Primary Industries and Regional Development's (DPIRD) Lessons Management Framework (LMF) enhances emergency response capabilities through continuous learning and adaptation. The framework elevates individual recommendations to a strategic level.

Escalation of Risk

A systematic process for identifying, prioritizing, and managing risks has been developed. This ensures visibility of risks across the organisation.

Visibility and Adaptation

The framework provides validation for adaptive changes and facilitates interagency collaboration and shared learning.

Data Collection: Real-time observations, interviews, and after-action reviews

Data Analysis: Grouping observations into insights and recommendations.

Validation: SME groups validate and prioritise recommendations

Recommendations: Escalated to Lessons Management Committee

Introduction of Findings Validation Meetings

Adaptive Feedback

- Validation meetings strengthen accuracy and feedback mechanisms.
- Ensures recommendations are actionable and relevant and utilises momentum of meeting to achieve small incremental changes.

Enhanced Strategic Process

- Continuous improvement through stakeholder feedback.
- Integration of findings into future response strategies.

Improved emergency preparedness

Efficient and effective responses

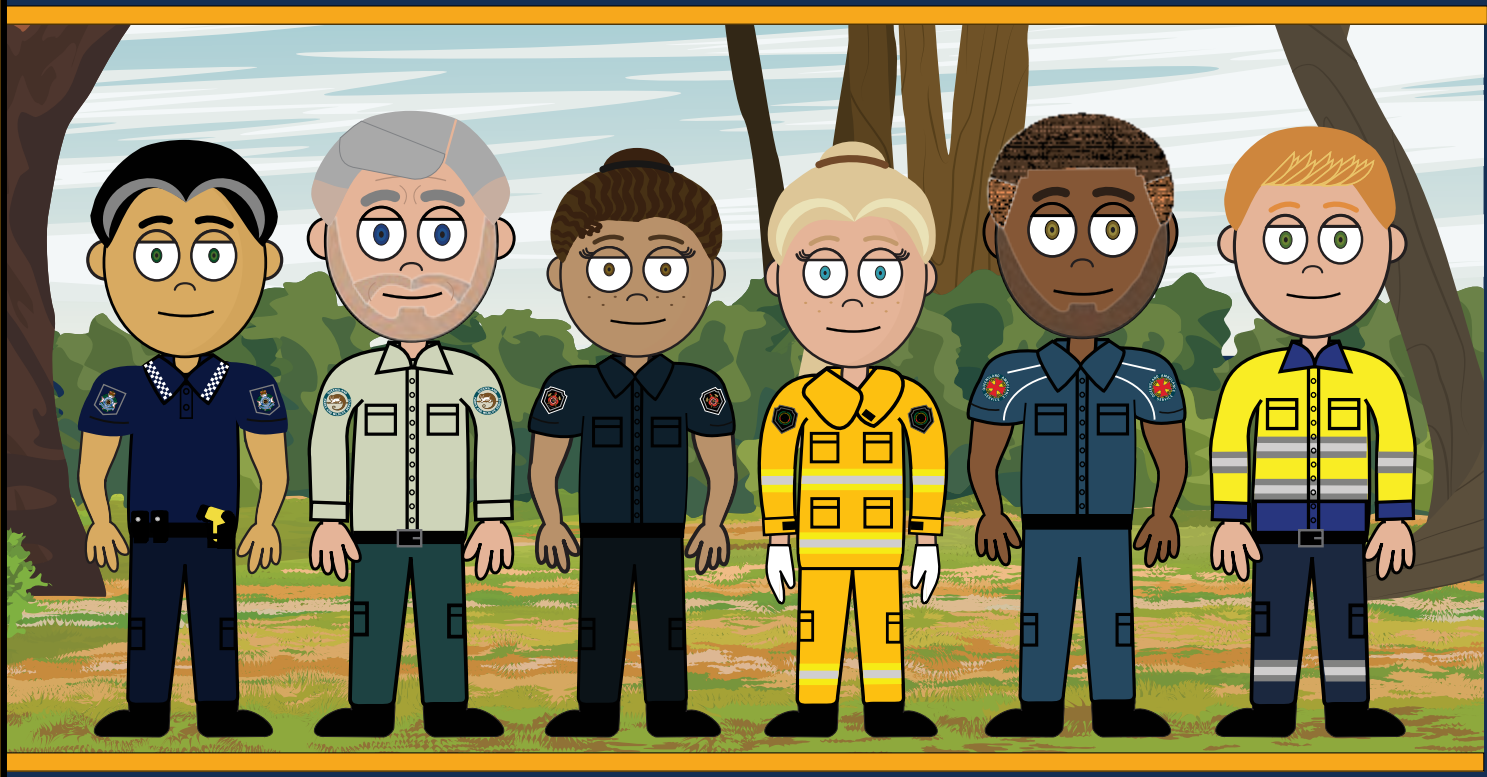
Holistic improvement from addressing challenges and sustaining successful practices

[1]NSW Department of Primary Industries and Regional Development, Biosecurity and Food Safety
[*]leigh.pilkington@dpi.nsw.gov.au

Lessons from the Bush Rat

QUEENSLAND FIRE DEPARTMENT

Did you know?
The Australian Bush Rat species have learned to work together to adapt and thrive. Cooperation within social groups can be crucial for survival, especially as our planet's climate becomes hotter, drier, and less predictable.



"How strengthening relationships and adaptability turned a community from outrage to praise through collaborative mitigation."

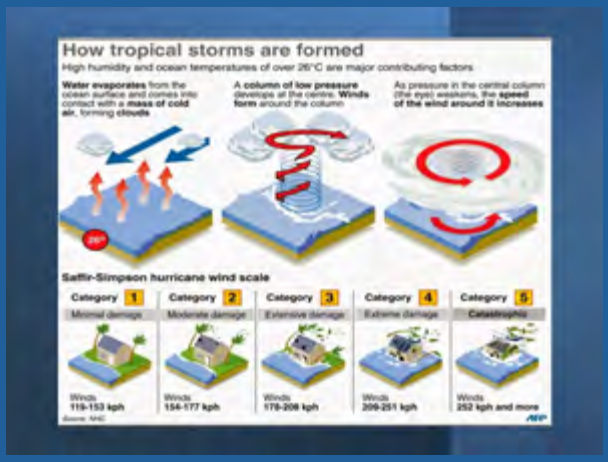
By fostering interagency collaborative relationships, we can work together during the Prevention and Preparedness phase for bushfires.

RURAL FIRE SERVICE QUEENSLAND

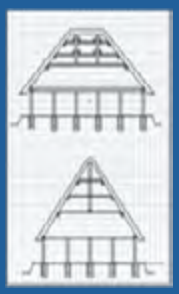
QUEENSLAND FIRE DEPARTMENT

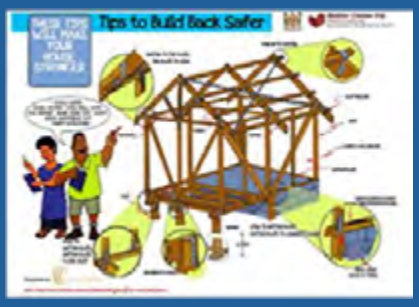
Queensland Government

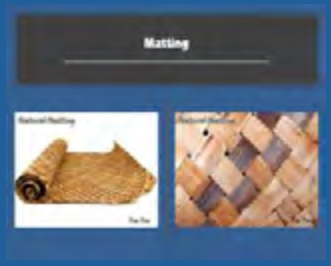
Place Based Approaches

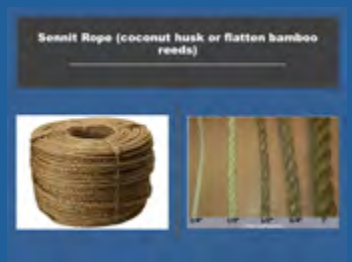


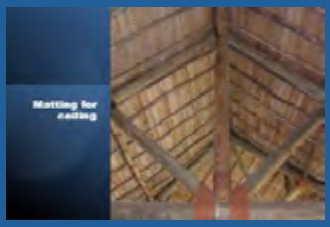
Innovation : Using Traditional Ecological Knowledge in Traditional homes in South Pacific to build cyclone resilient housing.

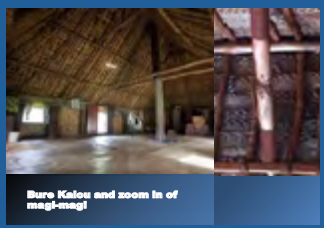


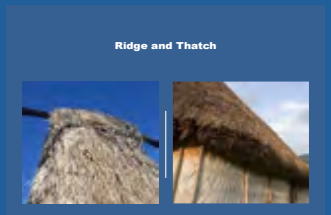


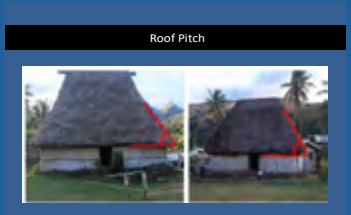












Highlights

Traditional Roof
- Magi-magi
- Pitch 60 degrees
- Threaded thatch
- Fumigation
- Netting
- Central post
- Ridge beam
- Corner posts
- Foundations Yavu

Modern Roof
- Screws not nails
- Thicker sheets
- Tie down chain
- Foundations

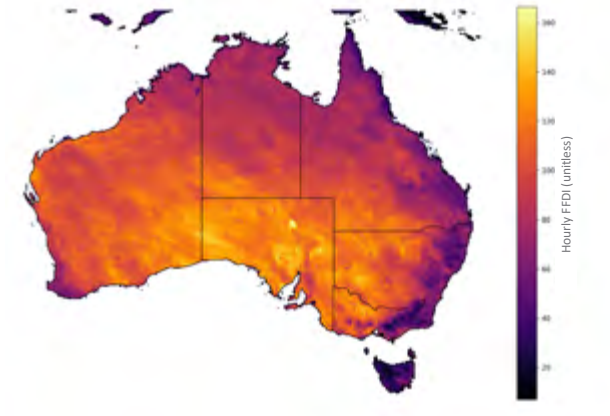
We are creating nationally standardised, customisable **bushfire hazard data** that is climate adjusted, tailored to you and easy to access

CSIRO's National Bushfire Intelligence Capability (NBIC)

The challenge: Australia's landscape is naturally susceptible to fires. Understanding how changes in fuels, land use and climate shifts affect bushfire risks is crucial to adapting and preparing for severe bushfire occurrences.

Our mission

The National Bushfire Intelligence Capability's mission is to provide nationally standardised bushfire hazard data to help the community adapt to future bushfire events while minimising environmental impacts. This includes reducing the hazard from fires as well as supporting recovery after a bushfire.



Forest Fire Danger Index (FFDI) for an event that has a 2% chance of occurring in any given year (i.e. a 2% annual exceedance probability)

FFDI is used as a measure of fire weather potential and is strongly embedded into state and territory legislation. FFDI is calculated using **hourly concurrent conditions** across 40+ years of data at 10 km resolution using historical weather reanalysis (**BARRA-R2**). This data is then processed using NBIC **extreme value analysis** to model a range of annual exceedance probabilities up to 0.5%

How we achieve impact

The National Bushfire Intelligence Capability will achieve this mission by assisting decision makers at the local, state and national levels of government to easily access bushfire hazard data, workflows and underlying data layers. This range of data layers and workflows allows a high degree of customisation so that users can tailor these to support their specific needs.

Together we are producing, updating and maintaining bushfire hazard data, workflows and underlying data layers that are:

- standardised
- nationally consistent
- current
- scientifically credible
- accurate
- quality assured

The National Bushfire Intelligence Capability has:

1. Developed a sequence of repeatable modular workflows to produce national data layers for terrain, fire weather potential (pictured), vegetation and fuel load. This is combined into nationally standardised estimates of local fire severity as well as potential building losses.
2. Established governance structures with state, territory and federal government agencies that support co-development and best available data inputs so that products meet their needs.
3. Commenced discussions for data sharing to ensure these workflows and data supply chains are sustainable over time.

The National Bushfire Intelligence Capability process explained

FOR FURTHER INFORMATION
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research.csiro.au/nbic

The **National Bushfire Intelligence Capability** is funded by the **Australian Climate Service**, led by **CSIRO** and supported by the **National Emergency Management Agency**. We take a collaborative approach to work with national, state and territory agencies.

HeatWatch

A Co-designed Application for Personalised Heat Health Risk Management

Federico TARTARINI, Ollie JAY. The University of Sydney

Introduction

Extreme heat and heatwaves present a major global health risk. Public health advice often struggles to provide personalized and actionable guidance that effectively reaches people in the community.

Methodology

HeatWatch leverages a user-centred design informed by conducting workshops with community partners and focus groups targeting people from vulnerable groups (n=155). It utilizes a thermophysiological algorithm that considers environmental and personal factors to estimate personalized heat health risk, as well as low-cost and simple-to-implement cooling strategies.

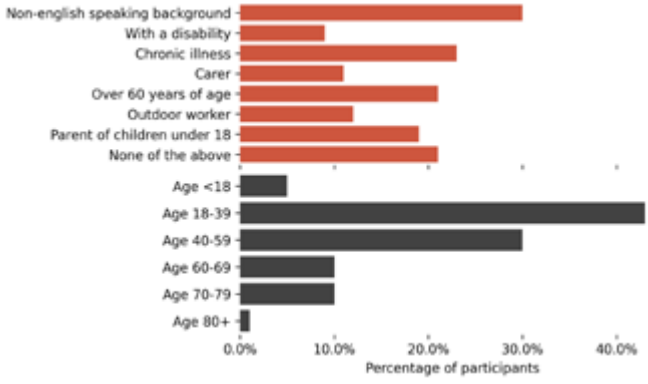


Fig 1 - *Sociodemographic characteristics of focus groups participants.*

Results

During its pilot launch in Australia (Summer 2023-24), HeatWatch attracted over 4,000 users, demonstrating its potential for widespread adoption.

Fig 2 - *Number of unique users who utilized HeatWatch (source: Google Analytics) alongside the dry-bulb air temperature measured in Sydney.*

Conclusion

HeatWatch offers a unique personalized approach to heat risk management, with the potential to significantly reduce heat-related health impacts if deployed at the population scale.

Fig 3 - *HeatWatch allows users to create personalized profiles.*

GET THE APP

VIDEO

RFS

Embracing Technological Innovation to Meet Escalating Risks

High-level Solution Architecture for OMS

Author: Matthew White

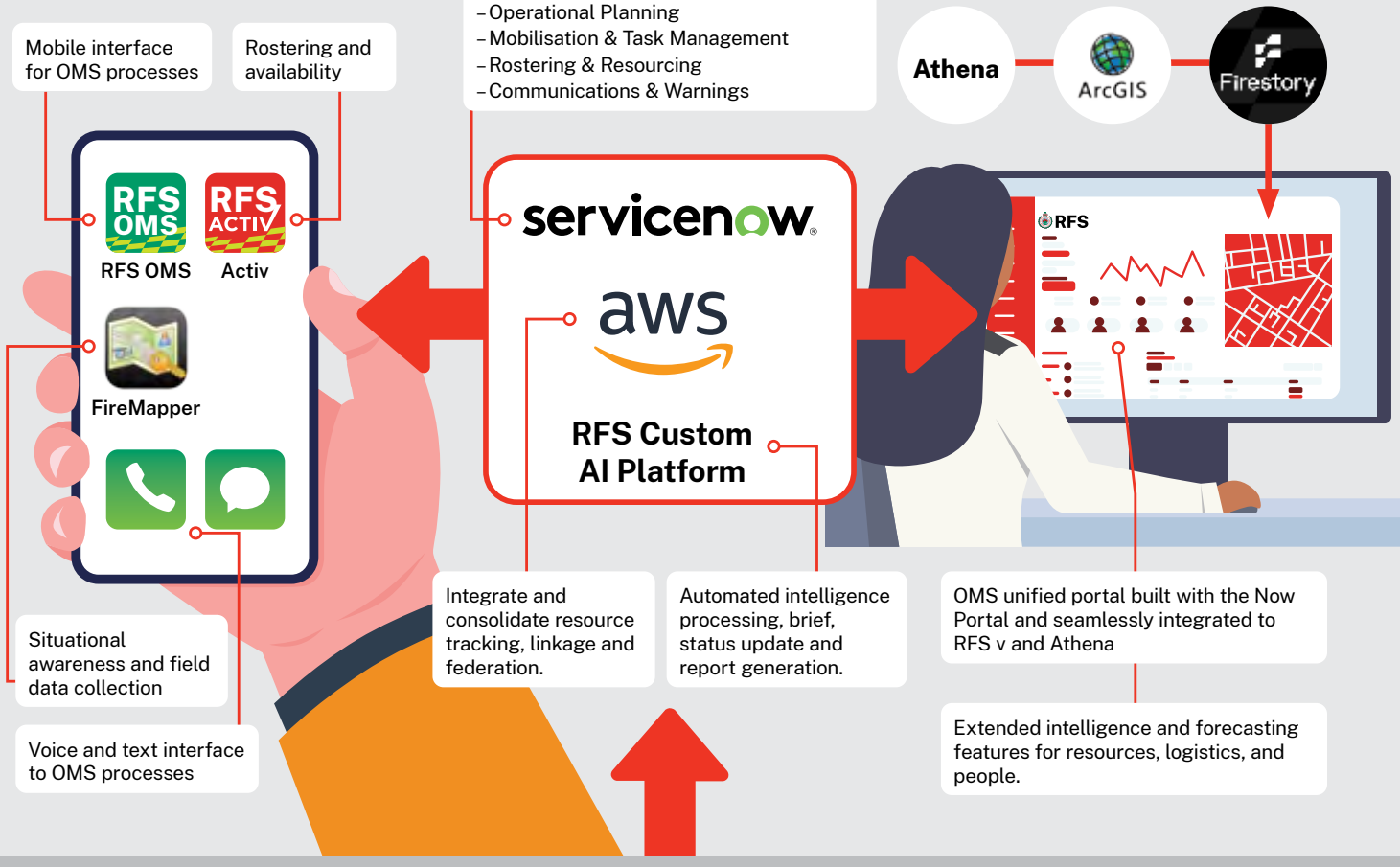
In the Field

For all RFS and non-RFS people in the field

OMS Core

Command & Control

At a desk in a control room or base camp



Integrated Systems

twilio · FUJITSU · ARENA · EMERGENCY ALERT. BE WARNED. BE INFORMED. · Adashi · SAP

NSW GOVERNMENT

Other agencies

Modelling post-fire debris flows to inform management of Sydney's drinking water catchments

Noda Sharifi Soltani[1,2], Zacchary Larkin[1,2], Rajitha Athukorala[3,4], Petter Nyman[5,6]

Introduction

Post bushfire debris flows are rapidly flowing mixtures of water, soil, rock, and debris that can occur in areas recently affected by bushfires. They can damage water infrastructure and are often associated with significant declines in water quality and long-term impacts for downstream waterways. During the 2019/20 bushfires, ~ 30% of Sydney's drinking water catchment areas were burnt causing significant declines in water quality during subsequent rainfall.

Figure 1 Study area – Sydney's drinking water catchments.

Model and Method

High-resolution aerial imagery was used to map individual debris flows in the Lake Burragorang catchment (Fig. 2A). Debris flow susceptibility modelling was undertaken using a logistic regression approach incorporating key predictive factors such as slope, aridity index, fire extent and severity, soil erodibility, and geology.

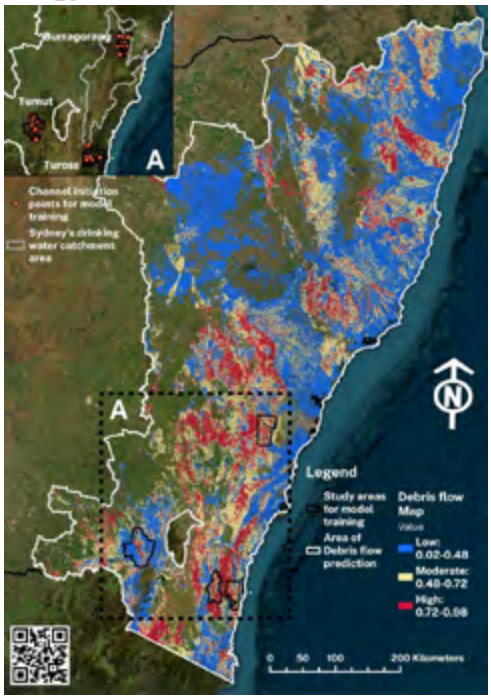


Figure 2 Debris flow observations were used for training, calibrating and validating the model.

Results

The findings reveal that Lake Burragorang and Lake Yarrunga are most susceptible to debris flow activity within their catchments. Lake Avon, Lake Cordeaux and Lake Cataract catchments, however, have much lower debris flow susceptibility after severe fire. Lake Burragorang accounts for the highest proportion (59%) of Sydney's drinking water supply, exhibits the highest average debris flow risk at ~ 70%.

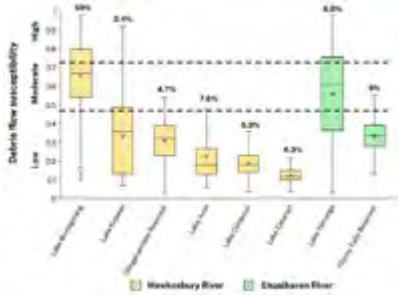


Figure 3 Average debris flow susceptibility in the main Sydney drinking water reservoirs.

Conclusion

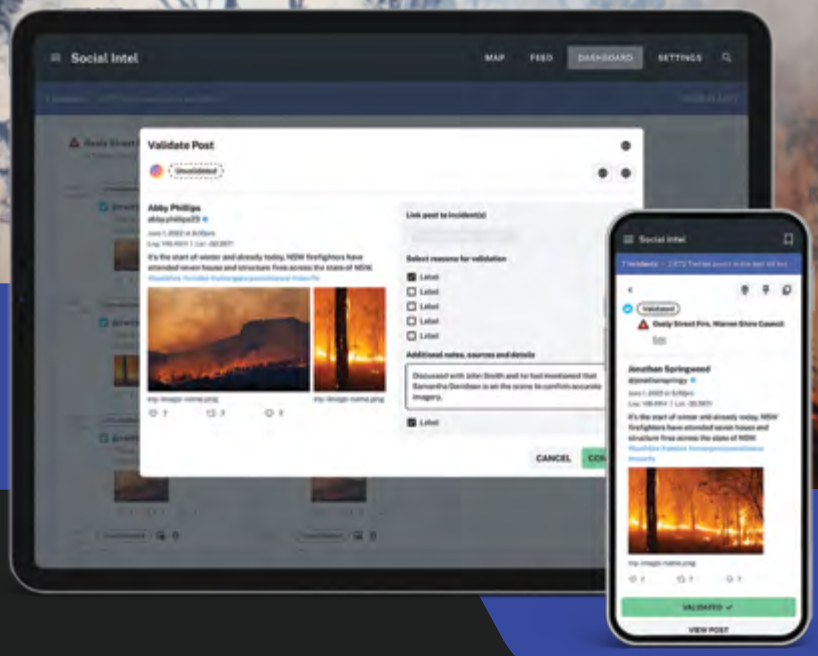
Debris flow susceptibility modelling can assist with bushfire risk assessments by highlighting regions most susceptible to severe post-fire erosion. It can inform the prioritisation of risk reduction activities and post-fire management efforts, such as slope stabilisation and vegetation management.

Acknowledgements

Yang, X., Zhang, M., Oliveira, L., Ollivier, Q.R., Faulkner, S. and Roff, A., 2020. Rapid assessment of hillslope erosion risk after the 2019–2020 wildfires and storm events in Sydney drinking water catchment. *Remote Sensing*, 12(22), p.3805.

environment.nsw.gov.au/science

This project is a component of the **2019/2020 Bushfire Inquiry project** undertaken by the **Estuaries and Catchment team**, within **Water, Wetlands and Coastal Sciences branch** of the **Science, Economic and Insight division** at the **Department of Climate Change, Energy, the Environment and Water**. This project aligns with one of the primary objectives of the Bushfire Inquiry project which is to understand the impacts of bushfires on waterways.



FIRES IN THE FEED:

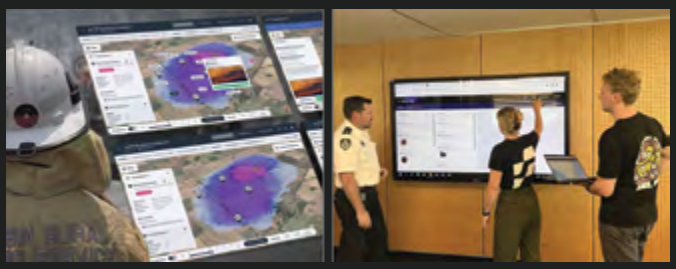
Using Social Media for Early Detection of Bushfires

Learn more at **firestory.io**

Scan to watch **YouTube video**

WHAT IS FIRESTORY?

Firestory is an all-hazards intelligence platform designed to optimise decision-making across all phases of the disaster intelligence cycle. Its modular architecture enables customers to configure and tailor it to suit their specific business needs. This approach allows for flexible and customised capability development and allows users to select only the features they require.



UTILISING SOCIAL MEDIA DATA WITH COMMERCIAL MODELS

Firestory's Social Intelligence module is an Artificial Intelligence (AI) capability that automatically processes social media posts to identify content about bushfires. Posts are filtered based on their location, keywords and hashtags, and the content of posted images - to find those relevant to bushfires within a pre-determined area of interest. **The images are scanned using a Machine Learning (ML) model, trained to identify images containing bushfire and smoke from bushfires.** The purpose of the Social Intel module is to leverage public social media data to rapidly identify and locate unreported bushfires, and to further utilise social media posts to build a more detailed picture of an ongoing incident - in turn aiding the efficacy of response efforts. The current version of Social Intel employs a commercially available Computer Vision model not specifically trained for the Australian context.

BUILDING A NEW AUSTRALIAN SPECIFIC MODEL

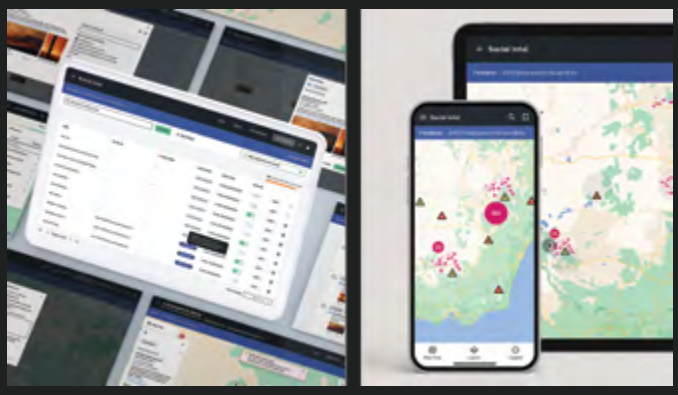
In 2023, Firestory was awarded a grant through the Bushfire Technology Pilots Program Grants, facilitated by the NSW Office of the Chief Scientist and Engineer. The purpose of the project was to build a new machine learning model specific to the Australian context—the Firestory Bushfire Recognition Model (FBRM). By training the model on imagery of Australian bushfires and vegetation, we aimed to improve the accuracy of the detections — ensuring fewer fires on social media are missed (i.e. False Negatives), whilst also reducing the burden on users to review posts that do not contain bushfire or bushfire smoke (i.e. False Positives). Stakeholders from NSW NPWS, FCNSW and NSW RFS helped develop the model by providing user feedback and imagery to both train and test the model.

HOW DO THE MODELS COMPARE?

We used a test data set to assess the performance of the new model and compare it to the performance of the original commercially available model. When tested against a common test set of imagery, **the new Firestory Bushfire Recognition Model (FBRM) achieved an outstanding accuracy rate of 99.5%—** compared to an accuracy of 94.5% for the same test set for the commercial model. Based on the test set of 830 images, 36 more images of bushfires were identified that would previously have been missed by the old model, and 6 fewer images are incorrectly surfaced to the user that didn't contain bushfire or smoke.

WHAT'S NEXT FOR FIRESTORY?

The Bushfire Technology Pilots Program Grants project has proven the value of building machine learning models specific to Australia. To optimise the use of AI for disaster response, we need to continue improving model performance, integrate with more social media platforms, and include **additional machine learning models that identify other images, such as flood damage, people or assets at risk.** In this way, we can extend the capabilities of Firestory, supporting the all-hazards use case and continue to protect our environment from disasters.



KABL AMO Firestory RFS

www.firestory.io

Co-designing a Bushfire Surveying System application enabling government agencies, researchers and citizens to collect and analyse data for bushfire impacted areas

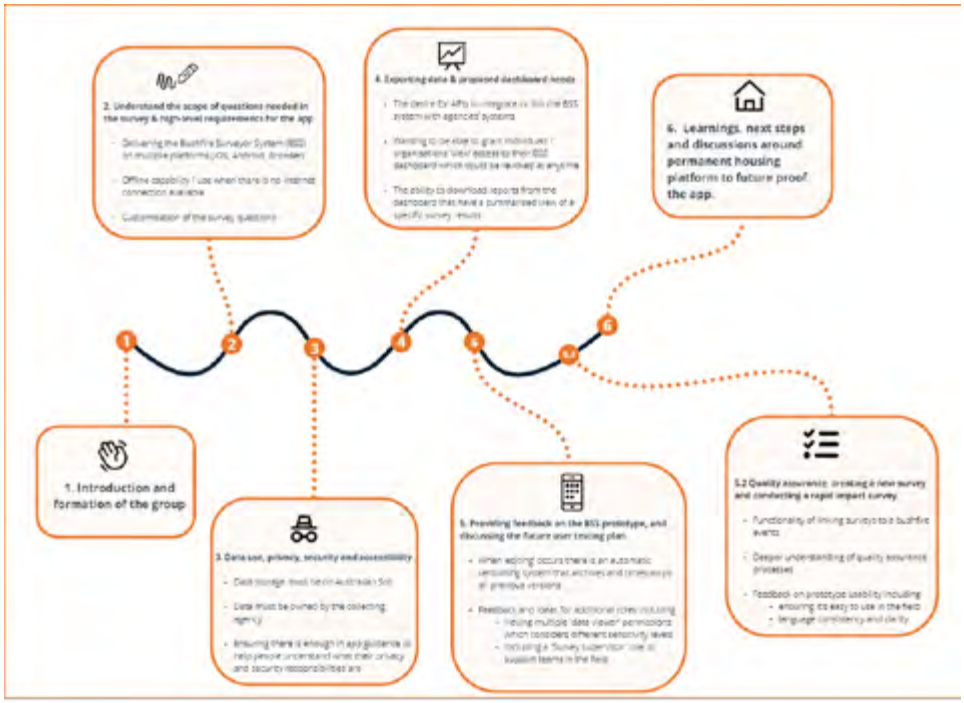
Building the next generation of post-bushfire survey tools

Why is post-bushfire information important?

- Post-bushfire surveys are crucial for understanding the impact of bushfires on houses, infrastructure, and on ecological, environmental, and cultural values.
- Efficient data collection and analysis ensures that lessons learned are quickly applied.
  CSIRO and other agencies have been conducting post-bushfire surveys for more than 40 years. Over this time, CSIRO has guided the evolution of survey methods, from analogue to digital. The Bushfire Surveyor System (BSS) is the next generation of this work.
- In the short term, surveys can provide a quick evaluation of sites affected by bushfire, while in the long term, survey learnings can inform and improve on bushfire mitigation and adaptation strategies.

Developing nationally consistent post-bushfire data collection:

- Co-designed with state and territory government agencies to create an intuitive and collaborative user experience.
- High quality, secure and nationally consistent data.
- Customisable, while maintaining consistency by allowing users to choose from a comprehensive and modular question library.
- Reducing subjectivity of data collection by providing support and easy to understand definitions.
- Drawing on existing data standards.
- Recognising and integrating existing systems.
- Accessible to more people because there are no enterprise licenses.



The Working Group engagement and insights roadmap

Working group composition:

Representatives from numerous fire, land management and emergency service agencies were included:

- New South Wales Rural Fire Service, Victorian Country Fire Authority, Western Australian Department of Fire and Emergency Services, Queensland Fire and Emergency Services
- South Australia Police, ACT Emergency Services Agency, South Australian Department of Premier and Cabinet, NSW National Parks and Wildlife Service
- Australasian Fire Authorities Council (AFAC)

Working group outcomes:

Over 6 meetings we gained valuable insights into user needs and operational environments to inform the development of the Bushfire Surveyor System. These included: typical phases of data collection, tools and technologies, post-bushfire survey protocols, data governance, accessibility, security, and ethical considerations.

Raphaele Blanchi, Garth Warren, Neil Cooper, Elana Berton, Peter Baker, Ranisa Gupta, Alessio Arena, Jonathan Yu, Mojtaba Rezvani

Scan the QR code to learn more about the Bushfire Surveyor System

National Bushfire Intelligence Capability (NBIC)

Preparing Australia for a changing climate by connecting local, state and national understandings of bushfire risk

NBIC is funded by the **Australian Climate Service**, led by **CSIRO** and supported by the **National Emergency Management Agency**

We take a collaborative approach to work with national, state and territory agencies

The Frequency of High-Intensity Fires has Increased in the Last ~200 years

Rebecca Ryan[1], Dr Zoe Thomas[2,3], Dr Ivan Simkovic[4], Prof Pavel Dlapa[4], Dr Martin Worthy[5], Prof Robert Wasson[5,6], Prof Ross Bradstock[1], Prof Scott Mooney[2], Dr Katharine Haynes[1,7] and Prof Anthony Dosseto[1]

[1] University of Wollongong, NSW, Australia [2] University of New South Wales, NSW, Australia [3] University of Southampton, United Kingdom [4]Comenius University, Bratislava, Slovak Republic [5] Australian National University, ACT, Australia [6]James Cook University, QLD [7]Department of Climate Change, Energy, the Environment and Water, NSW, Australia

Assessing Changes in High Intensity Fire Events in Southeastern Australia Using FTIR Spectroscopy

We aim to assess how the frequency of high-intensity fire events has changed in southeastern Australia during the last ~3000 years and improve our understanding of the link between changes in climate and major fire events. Improved understanding of how the fire regime behaved in the past can allow better predictions of how it may change in the future.

Background

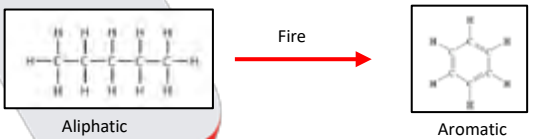
Four key factors drive the occurrence of a fire event, all of which are heavily impacted by global climate change. Understanding how fire characteristics have responded to these changes in the recent past is vital to inform future predictions of fire regimes. Existing records of past fire characteristics are historically limited (~50 years), therefore there is an urgent need to extend our bushfire record and understanding of past fire characteristics. FTIR identifies changes in chemical bonds through their unique interactions with infrared light. During a fire, bonds are typically created, destroyed or transformed which can be identified in the FTIR spectra.

Methods

Sediment samples were collected in the Blue Mountains and Namadgi National Park and analysed by potassium bromide (KBr) pressed disc FTIR spectroscopy. The FTIR results were paired with a radiocarbon- and optically stimulated luminescence (OSL)-based age-depth model to determine the changes to fire intensity over the last ~3000 years.

Results

Aliphatic compounds are the first to be decomposed when exposed to higher temperatures. This results in a relative increase in aromatic compounds. Aliphatic compounds are absorbed at 3000-2800 cm^{-1}, whilst aromatics are absorbed at 1750-1500 cm^{-1}. The ratio of these two compounds can inform of high severity fire occurrence (Fig 1).



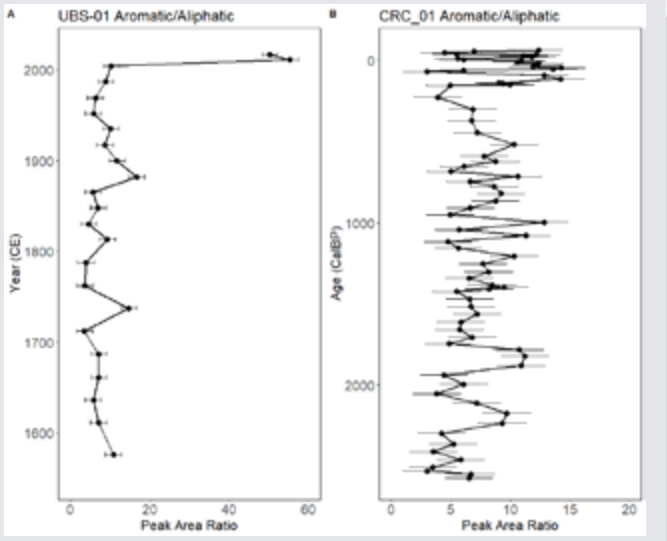


Fig 1: Aromatic/aliphatic (A(1750-1500 cm^{-1})/(A(3000-2800 cm^{-1})) peak area ratios for A) Urella Brook Swamp (UBS-01) and B) Cotter River (CR-01) as a function of the modelled sediment deposition age in CE (UBS-01) and CalBP (CR-01), respectively.

Conclusions

From our results, we hypothesise that the fire regime in both Namadgi National Park and the Blue Mountains arises from the complex interactions between climate, people and vegetation, thus increasing the frequency of extreme fire events. At both sites, this increase could be explained by a higher incidence of drought conditions that promote human and lightning ignitions. This, combined with increased eucalypt species abundance, could promote more high-intensity fire events.

Further information

For additional information scan the QR code or contact:

Rebecca Ryan, PhD Student, University of Wollongong
rjr072@uowmail.edu.au

The Australian Fire Danger Rating System: Technology Improvements.

Author/s: Dr Alex Holmes[1], Nikki Cummins[1], Dr John Runcie[1], James Monks[1], Dr David Dean[1], Dr Dan Krix[1], and Dr Meaghan Jenkins[1].
[1] NSW Rural Fire Service

The Australian Fire Danger Rating System (AFDRS) has been operational for over 18 months and operational-user experience has highlighted potential areas for improvement within the system web portals and tools.

The AFDRS National Team within the NSW RFS, the Bureau of Meteorology and AFAC Project Management Office, have developed a program of work (funded through the Minderoo Foundation) to provide a new Fuel State Editor application for offline use by Observers, and to design and scope national forecasting products and enable user experience improvements to the AFDRS web portals.

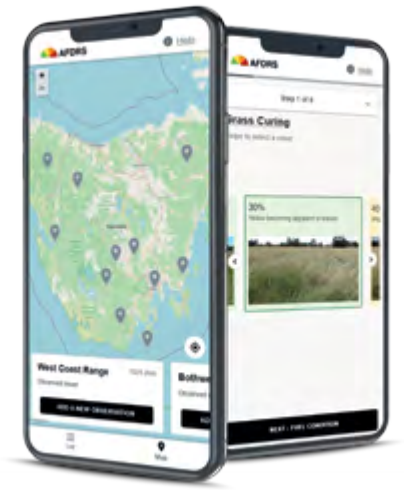
In addition to these, new tools have been created for Fire and Land Management Agencies to better access the model equations, code, research, and related analysis. These tools also allow for the integration of issues tracking, and development through collaboration of the system.

These include:

- Improvements to code infrastructure on GitLab.
- Including technical documentation in code releases.
- Code release notes for major and minor changes.
- Online platform for sharing documentation, code, and updates.

The improvement of the technology that underpins the AFDRS Fire Behaviour Index and Fire Danger Ratings will build confidence in the system which will in turn support operational decision makers to increase community safety.

For further information, please email afdrs@rfs.nsw.gov.au



AFDRS fuel state editor portal for entering fuel state observations

AFDRS "Danger Pages" web-portal for accessing code, technical documentation and model update information.

RFS afac MINDEROO FOUNDATION

THE UNIFIED WATCHTOWER

Multi-Source Intelligence for Remote Fire Detection & Risk Assessment

Learn more at **firestory.io**

Scan to watch **YouTube video**

WHAT IS FIRESTORY?

Firestory is an all-hazards intelligence platform designed to **optimise decision-making across all phases of the disaster intelligence cycle.** Its modular architecture enables customers to configure and tailor it to suit their business needs. This approach allows for flexible and customised capability development and will enable users to select only the features they require.

Firestory's Remote Detection and Risk Module was built as part of the Bushfire Technology Pilots Program Grants, facilitated by the NSW Office of the Chief Scientist and Engineer. The purpose of the project was to develop a multi-source intelligence system for early and remote fire detection and risk analysis. **By consolidating information from diverse data sources, Firestory could plug data gaps, detect fires early, and improve user efficiency.**

HOW DOES IT WORK?

Fires in remote areas often go unnoticed for longer due to lower population density. Although many sophisticated early detection capabilities are available, their coverage and efficacy are limited individually. Firestory aims to overcome these limitations by combining many data sources including: satellite infrared data, lightning strike data, social intelligence, GeoRSS incident feeds and geospatial data, to reduce temporal and geospatial coverage gaps. Firestory can also **support decision-making** by providing operators with an assessment of the likelihood that a hotspot is a real fire and an evaluation of the risk posed by potential ignition.

Firestory can help operators detect fires early and put them out while they are still small by:

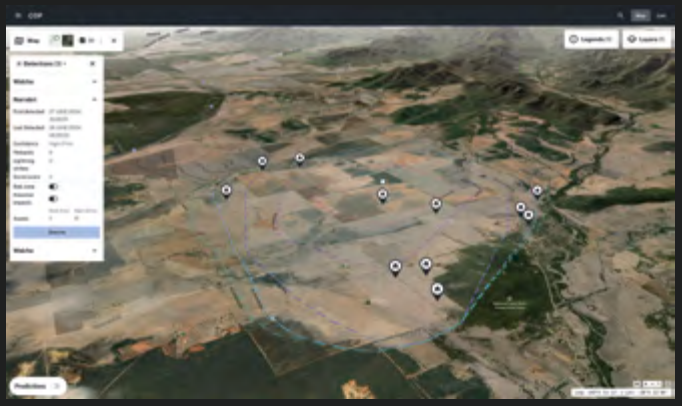
1. Combining a range of data sources to identify potential fires, and increase the operator's confidence and accuracy in fire detection assessments.
2. **Quickly assessing the risk posed by a potential fire and informing how urgently a confirmation response is required.**
3. Quickly confirming potential detections to shorten the investigation cycle and speed up the operator's response time.

Designed to be **data source agnostic**, the system can accommodate new and emerging sources of detection over time, including new satellite feeds, camera detections and ground based assessments of vegetation and moisture. This allows users to leverage cutting edge capability as it becomes available to them and grows the capability of the system over time. Firestory generates a confidence metric indicating the likelihood of a fire based on infrared hotspots in remote areas. When it detects a potential fire, it assesses the fire risk and provides information on the potential affected area and at-risk assets in the fire's trajectory. This allows operators to make informed decisions on confirming and responding to potential detections, optimising resource allocation.

HOW CAN REMOTE DETECTION & RISK WORK IN MY ORGANISATION?

While this module has not yet run for a full bushfire season, the preliminary results are extremely promising in terms of **identifying fires hours, and potentially days, ahead of known reported incidents**, and offering methods of confirmation at the desktop. The configurable nature of the module can also allow users to configure settings based on their priorities and workflows, such as, the alerting threshold, the risk threshold, or changing the geospatial layer of the assets at risk for monitoring (e.g. buildings, plantations, critical infrastructure, vulnerable habitat, or water catchments). Additional data sources can also be accommodated, such as AI derived detections from bushfire cameras, atmospheric sensors, or additional geospatial data contributing to risk such as soil moisture and vegetation conditions.

Firestory is not intended to replace any one method of detection. Instead, it leverages as many useful data sources as possible to optimise decision-making and help operators respond to fires as early as possible — a unified watchtower protecting our environment from future disasters.



KABLAMO Firestory RFS

www.firestory.io

Development and evaluation of an Australian specific camera-based smoke detection database

Nicholas Wilson[a*], Marta Yebra[ab], Geoff Cary[a], Gao Zhu[c], Nick Barnes[c], Weihao Li[c], Timothy Brown[d] and Ming-Dao Chia[d]

Fenner School of Environment & Society, [b] School of Engineering, College of Engineering, [c] School of Computing, College of Engineering, [d] Australian Plant Phenomics Facility, [*] presenting author.

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Bushfire Research Centre of Excellence

Project overview

- Automatic smoke detection from tower mounted cameras offers an opportunity to improve fire detection capabilities.
- There isn't often suitable data for evaluating what influences variation in the efficacy of different algorithms though.
- **Our objective** is to develop a publicly accessible database of smoke images with ancillary data to support a thorough evaluation of algorithms by researchers and fire managers.

Data collection

Smoke images from planned burns are simultaneously recorded from multiple locations using (see Fig 2):

- A permanently operating tower mounted camera installed by the Bushfire Research Centre of Excellence.
- Tripod mounted 4K video cameras temporarily deployed to record smoke images

Ignition time and location are recorded by researchers, ACT Parks and Conservation Service and Rural Fire Service.

Ancillary data such as camera location relative to the fire, atmospheric, fuel and topographic conditions are attributed *post-hoc*.

Results

Smoke from planned fires (with known ignition times and locations) were typically detected by smoke detection algorithms in 30 minutes (range 3-133 minutes) by cameras within 2-20km of the ignition (Fig 1 and 2). Although time to detection generally increased with distance, there was more variation between fires, than associated with camera distance (Fig 1).

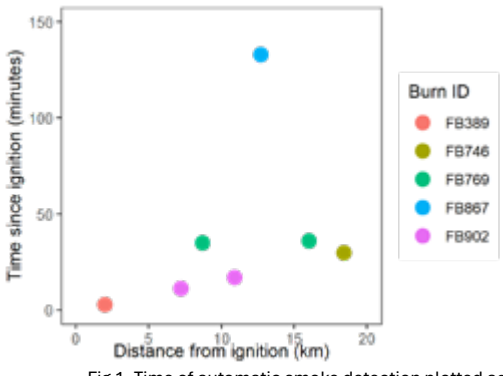


Fig 1. Time of automatic smoke detection plotted against the distance from the camera to the ignition. Points are colour coded by the fire that data was collected from.

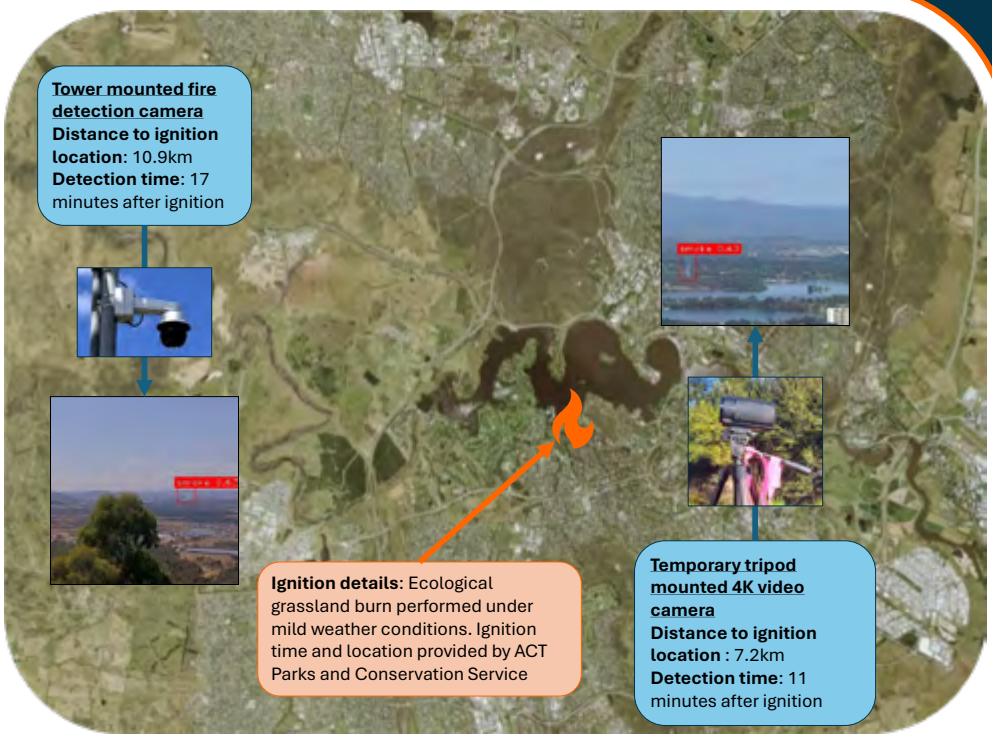


Fig 2. Example of smoke detection data collection. Sample images are the first detection for each camera over the approximate camera locations, with details about the camera type, proximity to ignition and time to detection. Ignition location is indicated by the flame symbol with ignitions details included as text.

Summary

- Fire managers need access to transparent information about where and when fire detection algorithms can provide reliable and timely detections.
- Fuel and atmospheric conditions may be significant sources of variation in time to detection, in addition to the proximity of the fire to the camera. Ongoing research will analyse these effects in more detail.
- Our dataset and analyses can be used to evaluate smoke detection algorithms, inform the placement of tower mounted cameras, and advance research in smoke image detection by identifying current limitations.

Like to get involved?

We want to grow an open-source smoke image dataset for training and evaluation. If you'd like to become involved as a contributor or evaluate a smoke detection algorithm, please contact us at bushfire.rcoe@anu.edu.au.

Understanding junction fire physics and scaling laws in order to mitigate the consequences of this severe wildfire event

Mr Ahmad Hassan[1,2], Prof Khalid Moinudin[2] and Prof Gilbert Accary[3]

[1] Natural Hazard Research Australia, Melbourne, Vic, 8001
[2] Institute for Sustainable Industries and Liveable Cities, Victoria University, Melbourne, Vic, 8001
[3] School of Engineering, Lebanese American University, Byblos, Lebanon

Physical modelling of junction fire behaviour: Underlying physics, fire regime, and scaling laws

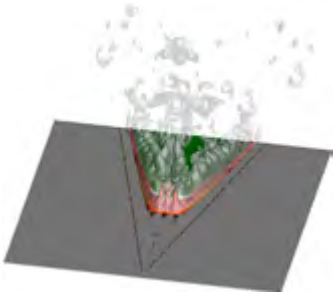
Extreme bushfires present severe threats globally. Junction fires stand out for their intense and unpredictable behaviour, requiring comprehensive understanding. This study delves into the physics governing junction fires to better understand their complex dynamics and to establish scaling laws describing their behaviour.

Objectives

- Have a better understanding of the complex dynamics of junction fires.
- Understand the effects of slope angles, junction angles and wind speed on junction fire behaviour.
- Conduct a dimensional analysis of the problem based on Byram's convective number.
- Bring together all scale experiments and simulations into one scaling law.

Methodology and Numerical Modelling

- Use of FIRESTAR3D, a physics-based model developed collaboratively by multiple universities.
- Conducting numerical simulations replicating laboratory and field-scale experiments.
- Explored the effects of parameters such as slope angles, junction angles, wind speed, fuel moisture content …



Preliminary Results and Discussion

- FIRESTAR3D effectively reproduced experimental results, demonstrating its capability in simulating junction fire propagation.
- Ongoing research aims to further explore the interplay between slope, junction angle, and wind speed.

The research boundaries are pushed using dimensional analysis in order to establish a similarity between real-world wildfire scenarios and scaled-down experimental or numerical models. Using Byram's convective number, we strive to characterise the balance between buoyancy and wind effects on flame trajectory and spread. And through the formulation of scaling laws, this work aims to provide valuable insights into the behaviour of junction fires at different scales. This would help in developing effective wildfire management strategies, ultimately contributing to the protection of lives, property, and ecosystems form wildfires.

For additional information scan the QR code or contact:
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Advancing Fire Severity Analysis: Object-Based Image Classification with Landsat 8 on Kangaroo Island

Jiyu Liu,[1] Dr David Freudenberger,[2] and Associate Professor Samsung Lim,[1]

[1] School of Civil and Environmental Engineering, Faculty of Engineering, The University of New South Wales, NSW
[2] Fenner School of Environment & Society, College of Science, The Australian National University, ACT

Mapping burned areas and land-uses in Kangaroo Island using an object-based image classification framework and Landsat 8 Imagery from Google Earth Engine

This study integrates a multi-resolution segmentation method and a hierarchical classification framework to classify burned areas in Kangaroo Island, South Australia. Demonstrating the efficacy of an object-based image classification approach combining color and shape features, we show that objects segmented from multi-source data result in higher classification accuracy.

Introduction

Variations in spectral reflectance, particularly in Near-infrared (NIR) and short-wave infrared (SWIR) spectra, enable the determination of forest cover loss post-fire events using remote sensing techniques.

Pixel-based image analysis struggles to interpret landscape texture, structure, and shape information from optical images, leading to "salt and pepper noise" and reduced classification accuracy. Conversely, object-based image analysis segments images into smaller, real-world objects using color, shape, and topological features, allowing for more accurate fire severity level analysis. It integrates various spatial and contextual attributes into the mapping process, thereby enhancing mapping accuracy.

Methodology

Study area

Kangaroo Island (36°05′12″S to 35°33′41″S, and 136°32′04″E to 138°00′00″E), is situated to the south of Saint Vincent Gulf, 112 km southwest of Adelaide.

Data processing

Google Earth Engine (GEE), a cloud-based computing platform, facilitated the selection, pre-processing, and downloading of Landsat 8 Surface Reflectance Tier 1 imagery. The study period for the fire was from October 2019 to February 2020. GEE was utilized to integrate all Landsat 8 Surface Reflectance Tier 1 images between June 1, 2019, and October 30, 2019, for pre-fire analysis, and between February 1, 2020, and May 30, 2020, for post-fire analysis, with cloud removal applied.

NASA Shuttle Radar Topography Mission (SRTM) data, including the 1-arcsecond Digital Elevation Model (DEM) and Digital Surface Model (DSM), were utilized to generate a Normalized Digital Surface Model (nDSM). This nDSM was computed to estimate vegetation height on Kangaroo Island.

Segmentation

In this study, we used the multiresolution segmentation algorithm to segment remotely sensed imagery by merging adjacent pixels or small objects based on spectral and spatial information. This algorithm calculated the minimal increase in defined heterogeneity f at each adjacent image object merging step. If this minimal increase f exceeded the heterogeneity threshold t defined by scale parameter Ψ, merging was terminated, and segmentation results were obtained, equation (1) (Benz *et al*. 2004).

$$f = w_{cl} \cdot \Delta h_{cl} + w_{sh} \cdot \Delta h_{sh} \qquad (1)$$

$$w_{cl} \in [0,1], w_{sh} \in [0,1]; while\ w_{cl} + w_{sh} = 1$$

Here, w_{cl} and w_{sh} are the spectral and shape weight parameters specified by the user. Spectral and colour heterogeneity difference Δh_{cl} were calculated as following equation (2) (Benz et al. 2004)and difference in shape heterogeneity Δh_{sh} using equation (3) (Benz *et al*. 2004).

$$\Delta h_{cl} = \sum_c w_c (n_m \cdot \sigma_{c,m} - (n_{Obj1} \cdot \sigma_{c,Obj1} + n_{Obj2} \cdot \sigma_{c,Obj2})) \quad (2)$$

$$\Delta h_{sh} = w_{cmp} \cdot \Delta h_{cmp} + w_{sm} \cdot \Delta h_{sm} \quad (3)$$

Here, n was the number of pixels in object. *Obj1* and *Obj2* represented two smaller image objects for merging process, and m represented the larger image object after merging.

Difference in smooth heterogeneity Δh_{sm} and compactness heterogeneity Δh_{cmp} as equation (4) and (5) (Baatz and Schape, 2000; Benz *et al*. 2004):

$$\Delta h_{sm} = n_m \cdot \frac{l_m}{b_m} - (n_{Obj1} \cdot \frac{l_{Obj1}}{b_{Obj1}} + n_{Obj2} \cdot \frac{l_{Obj2}}{b_{Obj2}}) \qquad (4)$$

$$\Delta h_{cmp} = n_m \cdot \frac{l_m}{\sqrt{n_m}} - (n_{Obj1} \cdot \frac{l_{Obj1}}{\sqrt{n_{Obj1}}} + n_{Obj2} \cdot \frac{l_{Obj2}}{\sqrt{n_{Obj2}}}) \quad (5)$$

Here, l *is the* perimeter of object and b is perimeter of object's bounding box.

Results and Classifications

All bands or layers were equally weighted for multiresolution segmentation. We evaluated various parameters and criteria, with Figures 1(a)–(c) illustrating the MRS segmentation results. Segmented objects exhibited differences across different data combinations while maintaining the same scale parameter and homogeneity criterion composition.

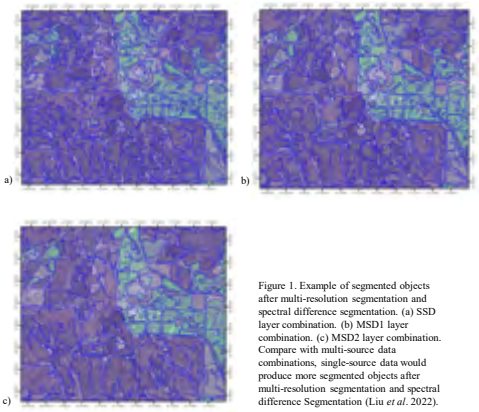

Figure 1. Example of segmented objects after multi-resolution segmentation and spectral difference segmentation. (a) SSD layer combination. (b) MSD1 layer combination. (c) MSD2 layer combination. Compare with multi-source data combinations, single-source data would produce more segmented objects after multi-resolution segmentation and spectral difference Segmentation (Liu *et al*. 2022).

Hierarchical classification, utilizing expert-based spectral and shape knowledge, was applied in this study. It allows for the establishment of complex classification rules across various classes in the hierarchy. Spectral and shape characteristics, including Landsat imagery bands, spectral indices, and nDSM, were considered, reflecting contextual relationships within the study area's landscapes. Fuzzy classification using membership functions and thresholds classification with class descriptions were both utilized. To define membership functions, new expressions were created for each class. A strict trial-and-error approach was necessary to ensure classification accuracy.

Figures 2(a)–(c) display the classification results of segmented imagery, depicting three fire severity levels and five unburned classes: (1) Water Bodies; (2) Buildings & Bare lands; (3) Undisturbed Farmlands & Grasslands; (4) Cleared Farmland; and (5) Unburned Woodlands and Forests. Overall, the classification results of the three different layer combinations exhibit visual similarity on a large scale. The wildfires of 2019–2020 on Kangaroo Island are predominantly located in the western part of the study area, with most burned areas situated in Flinders Chase National Park. However, some burned areas are dispersed throughout the middle of the island due to the wildfire spreading into agricultural and plantation forestry areas.

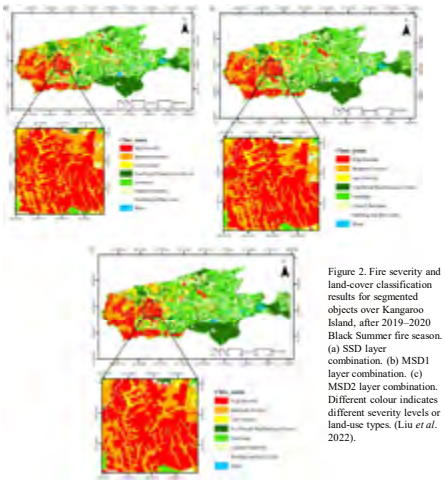

Figure 2. Fire severity and land-cover classification results for segmented objects over Kangaroo Island, after 2019–2020 Black Summer fire season. (a) SSD layer combination. (b) MSD1 layer combination. (c) MSD2 layer combination. Different colour indicates different severity levels or land-use types. (Liu *et al*. 2022).

McNemar's test yielded p-values of $2.44 * 10^{-6}$ for MSD2 vs. MSD1 and $1.01 * 10^{-8}$ for MSD2 vs. SSD, indicating significant differences in classification accuracies at the 99% confidence interval. Additionally, the p-value was $6.19 * 10^{-2}$ for MSD1 vs. SSD, suggesting no statistically significant difference in accuracy at the 95% confidence interval, yet still significant at the 90% confidence interval. Overall, MSD2 segments exhibited higher accuracy compared to MSD1 and SSD, implying that incorporating relevant vegetation indices and multi-source data can enhance classification accuracy.

The pixel values of fire indices were extracted from classified burned areas and subjected to statistical analysis. PostNBR, dNBR, and RdNBR indices exhibited significant differences across fire severities in the segments classifications. This suggests that our object-based image analysis method effectively classifies various fire severity levels, with statistically significant classification results.

In terms of accuracy, the Landsat 8's 30 m resolution led to mixed pixels in built-up areas, misclassifying buildings. However, our method performed well for vegetated or burned areas across all three layer combinations. MSD2 achieved the highest accuracy at 90.2% and a Kappa coefficient of 0.852. SSD achieved an acceptable accuracy of 87.4%. Even with limited data, single-dataset segmentation provided insights into land types and fire severities. Nonetheless, SSD lacked detail and smoothness at burned area edges, limiting its suitability for small-scale bushfire scenarios.

References

Benz UC, Hofmann P, Willhauck G, Lingenfelder I, Heynen M. 2004. Multi-resolution, object-oriented fuzzy analysis of remote sensing data for GIS-ready information. ISPRS J Photogramm Remote Sens. 58(3-4):239-258.

Baatz M, Schape A. 2000. Multi resolution segmentation: an optimum approach for high quality multi scale image segmentation. In Strobl J, Blaschke T, Griesebner G, editors, Angewandte Geographische Informationsverarbeitung. Heidelberg: Wichmann-Verlag; p. 12-23.

Liu J, Freudenberger D, Lim S. 2022. Mapping Burned Areas and Land-Uses in Kangaroo Island Using an Object-Based Image Classification Framework and Landsat 8 Imagery from Google Earth Engine. Geomatics, Natural Hazards and Risk. 13(1):1867-1897.

Further information

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How can Tasmania's endangered Pencil Pine teach us better bushfire management strategies?

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Response, resilience, and recovery of Tasmania's endangered Pencil Pine using a multi-archive palaeoenvironmental record

We aim to provide a multifaceted understanding of how fire-sensitive Pencil Pine, and the ecosystems in which they persist, have responded to extreme changes in climate and fire throughout the past 11,700 years (The Holocene) and improve our understanding of how best to target management efforts to protect these highly threatened ecosystems in a future shaped by rapid climate change.

Research context

Tasmania is home to some of the last remaining palaeoendemic tree species in Australia, many of which are located within the Tasmanian Wilderness World Heritage Area (TWWHA). Recent catastrophic wildfires in TWWHA have burnt over 14,000 ha of subalpine vegetation, destroying core habitat for remaining stands of very long-lived and fire-sensitive palaeoendemic tree species in Tasmania, including extremely fire sensitive palaeoendemic conifer *Athrotaxis cupressoides* (Pencil Pine). There are a multitude of complexities associated with managing and responding to fire in very remote, environmentally sensitive Tasmanian landscapes and it is vital that we have a fuller understanding of which populations of threatened and endangered species/ecosystems should be prioritised for management interventions and which require less intervention to bolster their resilience to climate change and fire.

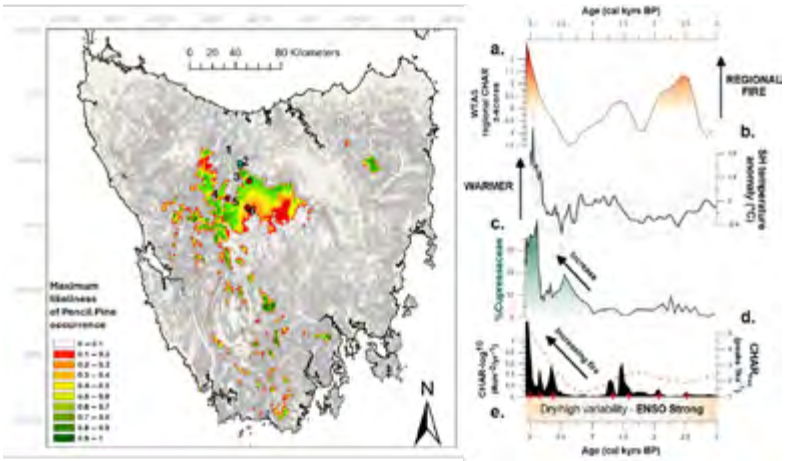


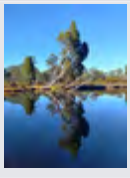
Fig. 1: Map of Tasmania displaying study sites (Caves: 1. Kubla Khan and 2. Mole Creek; Sediment cores: 3. Eagle Valley, 4. Lake McCoy, 5. Plunge Lagoon and 6. SCAR pond) relative to probability of Pencil Pine occurrence as determined through MaxEnt Species Distribution Modelling (left); summary graph from Site 3 showing relationship between a) synthesised western Tasmanian charcoal records, b) Southern Hemisphere temperature anomaly record; c) Pencil Pine (Cupressaceae) pollen percent count, d) fire frequency, e) macroscopic charcoal accumulation, throughout the past 3,000 years.

Methods

Sediment cores were extracted from four sites across the Central Plateau in Tasmania presenting different 'likeliness of Pencil Pine occurrence' scores – as determined through MaxEnt species distribution modelling (Fig. 1). Multi-proxy records were produced by analysing fossil pollen, charcoal (Fig. 1) and high-resolution stable isotope and trace element analyses on cave deposits with specialised techniques at ANSTO facilities, including Itrax micro-X-ray fluorescence core scanning and radiocarbon dating.

Conclusions

Pencil Pine display moderate-high resilience to fire during the early to mid-Holocene (~11,700 to ~3,000 years ago) across all sites. Northern sites display a higher likeliness of Pencil Pine occurrence in the contemporary landscape than southern sites. In the past ~3,000 years Pencil Pine increased (decreased) in northern (southern) sites, during periods of increasing temperature, moisture variability and fire. This warrants further consideration in conjunction with inter- and intrasite specific conditions to gain a holistic understanding of the factors which influence the reproduction and post-fire regeneration of Pencil Pine, and similar fire-sensitive ecosystems, under increasing climate change and fire pressures.



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Reconstructing historic bushfire evacuations in SPARK and SEEKER

Hepburn Springs February 2019 Bushfire Incident and Evacuation Case Study

Gabrielle Wehr, Dhirendra Singh, Richard Hurley, Pawan Gamage, Vincent Lemiale

Computer reconstructions of past incidents can help inform future planning. We reconstructed the bushfire and evacuation of Hepburn Springs, VIC, from Feb 2019. We then investigated a hypothetical counter-factual scenario in which the fire was not contained by suppression efforts, to estimate how bad it could have been [1].

How we created the computer simulations

A Advanced modelling tools were used with event data collected from primary & secondary sources to model scenarios.

SPARK [2] simulated fire spread in the landscape. SPARK uses configurable spread models with a raster-based level set method to calculate fire speed and direction given fuel and weather data.

SEEKER [3] modelled community evacuation. SEEKER combines fire spread with a synthetic population of vehicles in the region, a model of the available roads, emergency warnings, traffic management, and road closures. A sophisticated human behaviour model using Belief-Desire-Intention reasoning captures individuals' behaviours and the MATSim traffic simulator plays out decisions as induced traffic on roads [4].

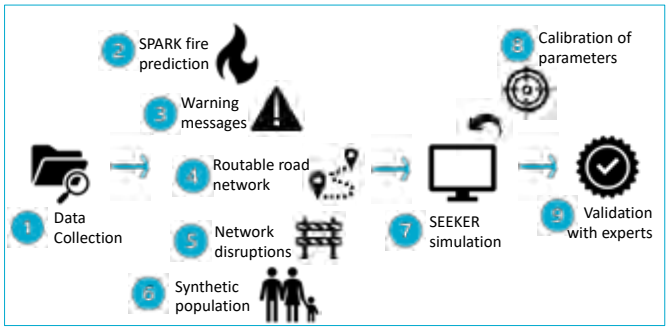

Figure 1: Methodology for simulating the bushfire evacuation scenario in SPARK and SEEKER

B Bushfire spread was reconstructed in SPARK to estimate its spatio-temporal progression from ignition to completion. Data from the incident management team was used, including:

- geo-referenced imagery
- geo-mapped fire extent
- suppression effectiveness
- hourly hind-casted weather data

Figure 2: The final SPARK arrival time isochrones for the predicted fire run. Left: Illustration of the isochrones on a 2D topographic map. Right: Isochrones overlayed on 3D satellite imagery.

C Evacuation was reconstructed in SEEKER to simulate the likely egress of vehicles out of the region. Model parameters were determined using data on the location and timing of emergency warnings, door-knocking and traffic management by emergency services.

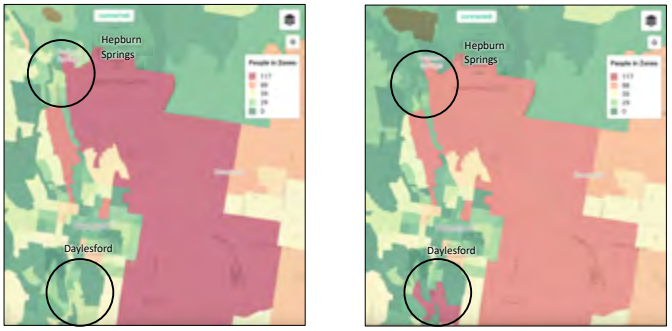

Figure 3: SEEKER output showing change in number of people in Hepburn Springs and Daylesford (black circles) between 6pm Feb 2 (left) and post-evacuation at 10am Feb 3 (right).

The model simulated community response to an appropriate level of detail, corroborating the accounts from emergency personnel and deriving plausible new details on the movements of evacuating vehicles.

What the counter-factual scenario revealed

Had the fire breached containment lines and travelled up the valley into the north of the town, there could have been:

- serious consequences for sleeping residents in Hepburn Springs,
- late-night traffic bottlenecks downstream in Daylesford (Fig. 4), and
- longer travel times to safety due to additional traffic on roads.

The scenario revealed that the emergency decisions taken during the real incident were exemplary and any delays could have quickly compounded the problem.

Figure 4: Left: SPARK fire run isochrones for the uncontained fire. Right: SEEKER output showed possible night traffic congestion (oval areas) in Daylesford with slower (orange) vehicle speeds.

FOR FURTHER INFORMATION

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REFERENCES

1. G. Wehr (2024). Historical Reconstruction of the 2019 Hepburn Springs Fire Evacuation. Report EP2024-2893.
2. C. Miller et al. (2015). SPARK – A Bushfire Spread Prediction Tool. *IFIP Advances in Information and Communication Technology*, vol 448.
3. L. Marquez et al. (2022). SEEKER: A Web-Based Simulation Tool for Planning Community Evacuations. *Proceedings of the 2022 ISCRAM Asia Pacific Conference*.
4. D. Singh et al. (2019). Using MATSim as a Component in Dynamic Agent-Based Micro-Simulations. *Engineering Multi-Agent Systems*, vol 12058, pp 85-105.

HOW SENSITIVE IS FUEL MOISTURE CONTENT (FMC) TO CLIMATE-INDUCED CHANGES TO VEGETATION STRUCTURE?

Tegan P Brown, Assaf, Inbar, Thomas J Duff, Patrick NJ Lane, Gary J Sheridan

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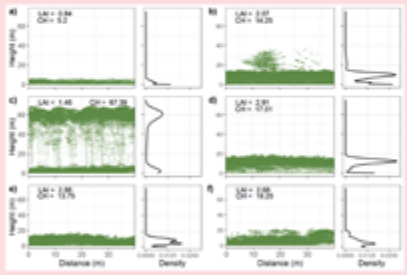
What we did:

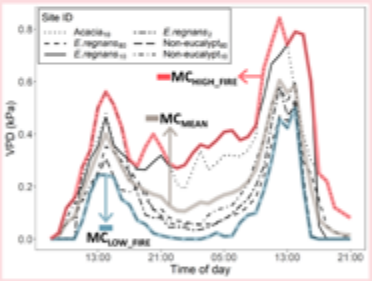
- Vegetation canopies buffer conditions at the forest floor.
- Climate change is altering vegetation type and structure across Australia.
- We don't know the impact this will have on drivers of flammability, such as FMC.

The aim of this study was to explore the sensitivity of FMC to changes in microclimate resulting from different vegetation structures in wet forests.

We collected data across six field sites in the wet forest niche with contrasting vegetation structure.



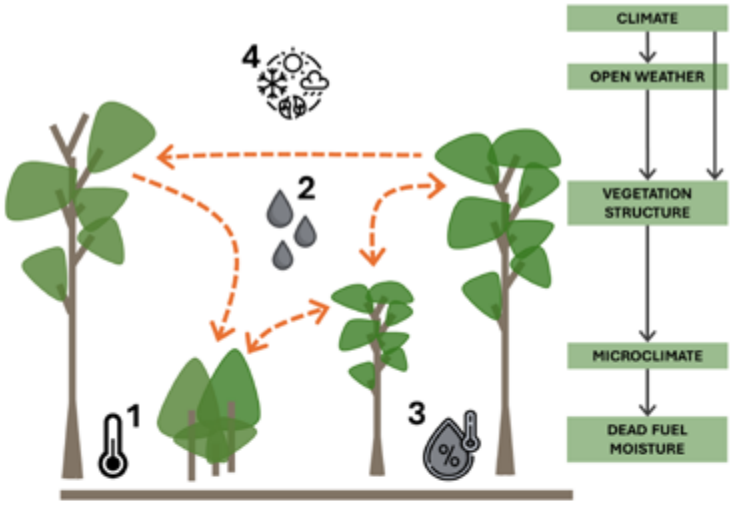
We extracted below canopy fire weather to build composite weather streams and model FMC sensitivity to vegetation change.



What we found:

1 Longwave radiation (LWR) was a key control on FMC in densely vegetated areas. However, LWR is not a common input to operational FMC models.

2 Rainfall pattern is important. High-frequency low-volume rain = high FMC. High-volume low-frequency rain = runoff & low FMC in summer.



3 Vegetation structure effects on vapor pressure deficit (VPD) increased the number of days fuels were available to burn (FMC < 16%) by 125% across spring, summer and autumn.

4 The season and the starting moisture content influenced which weather variable was most in controlling FMC dynamics. Wind was most important in Autumn, VPD (T & RH) in Spring.

What it means:

Through high-severity fire, dieback and windthrow events, climate change is altering vegetation composition and structure – with big implications for FMC and forest flammability. New vegetation structures will alter existing relationships between weather and the dry down of fuels that land and fire managers may be adapted to.

For a given amount of rainfall, high-frequency low-volume rain facilitates wetter fuels. High-volume low-frequency rain allows runoff, and in summer can lead to drier fuels. Important implications for shifting rainfall patterns with climate change.

We found that the controls on fuel dry-down changed with season. Wind was more important for FMC variability in Autumn, while VPD (T & RH) was a more important in Spring.

early warning network

Pioneering Forecasting Advancements in Disaster Management

At the forefront of severe weather and natural hazard forecasting and alerting, Early Warning Network is revolutionising disaster management through the application of AI and machine learning technologies. Through our innovative product suite and strategic partnerships with leaders in severe weather and climate technologies, we enable our clients to plan for and respond to events where timely and accurate information can make all the difference.

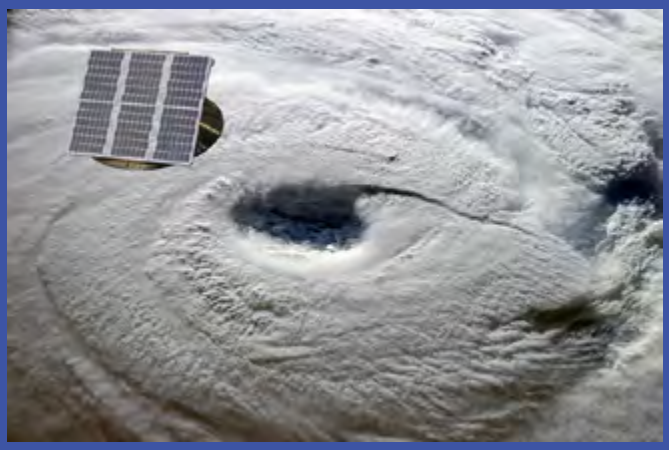
Through nearly 20 years of operation, Early Warning Network has seen increases in the frequency and intensity of severe weather events across the whole of Australia. Traditional approaches to the disaster management of these events are simply now not enough in many cases. By harnessing the power of satellite technology and advanced AI algorithms to forecast, detect and alert for dangerous conditions, we provide real-time, precise data to emergency personnel, businesses and communities, ensuring that they are well-prepared to respond to increasing threats.

Tomorrow.io: Enhancing Predictive Accuracy With Australian Firsts

Early Warning Network is proud to be the first Australian partner of Tomorrow.io - world leaders in weather resilience technology. Tomorrow.io's state-of-the-art weather resilience platform offers unparalleled predictive accuracy for users, meaning we can anticipate severe weather events with remarkable precision, allowing us to issue early warnings and mitigate the impact on vulnerable regions - a first for many rural areas in Australia.

Tomorrow.io have begun to deploy their own constellation of advanced satellites equipped with state-of-the-art sensors, so they can monitor atmospheric conditions with remarkable detail and frequency. Their network of low-earth orbit satellites will offer high-resolution observations of the Earth's surface, regardless of the presence of clouds or lack of daylight, which are significant limitations for optical and infrared sensors. The satellites are equipped with advanced radar technology capable of measuring precipitation, cloud structures, and even surface temperatures from space, which allows their platform to provide accurate weather forecasts and real-time monitoring of weather conditions, filling critical gaps in existing meteorological data.

Initial results show that Tomorrow.io's 1F system is 22-38% more accurate than general high-res models such as HRRR (High Resolution Rapid Refresh forecast model).



Enhancing Fire and Severe Weather Event Detection

We're proud to expand our bushfire services, and add our local knowledge and support to world-leading technology. Our platforms have dedicated fire features, helping businesses, organisations, and individuals make more proactive decisions to protect their properties, assets, health, or operations. Knowing when and where a fire or smoke could impact services or communities can help increase safety for staff members and residents, lower the risk of damage to property and assets, and overall enable better action plans around fires and the smoke they produce.

Powered by a proprietary global smoke model, Tomorrow.io provides tools such as Active Fires, Fire Index and Smoke Index to give users the ability to view all currently active fires globally along with the relative power, certainty, and origin of each fire based on the latest satellite imagery, along with general fire intensity potential, smoke movement and severity and predictive fire impact zones. Insights and alerts can be generated out to 14 days, to help with operational and emergency planning. Along with introducing the Tomorrow.io Resilience platform to our services, we are continuously exploring new technologies in fire detection and are investigating AI detection of fires, new ways to verify active fires and severe weather events, and other technologies which will see us lead the way in predictive accuracy in Australia.

Early Warning Nework have a long history of providing granular forecasting of severe weather events with high precision. Whether it is hail, thunderstorms, bushfires, floods or heatwaves, the predictive capability and expert verification of EWN's suite of services is crucial for early warnings of severe weather. Through exciting new partnerships such as with Tomorrow.io, we empower decision-makers, emergency personnel, and communities with the information they need to stay safe and make informed decisions.
Find out how Early Warning Network can enhance your ability to protect lives and property, & make a significant impact in disaster management and community resilience.

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