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The *Australian Journal of Emergency Management* is Australia's premier journal in emergency management. Its format and content are developed with reference to peak emergency management organisations and the emergency management sectors—nationally and internationally. The journal focuses on both the academic and practitioner reader. Its aim is to strengthen capabilities in the sector by documenting, growing and disseminating an emergency management body of knowledge. The journal strongly supports the role of the Australian Institute for Disaster Resilience as a national centre of excellence for knowledge and skills development in the emergency management sector. Papers are published in all areas of emergency management. The journal encourages empirical reports but may include specialised theoretical, methodological, case study and review papers and opinion pieces. The views in the journal are not necessarily the views of the Australian Government, Australian Institute for Disaster Resilience or its partners.

Aboriginal and Torres Strait Islander peoples are advised that this publication may contain images of deceased people.

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# Contents



Contributions in the Research section of the *Australian Journal of Emergency Management* are peer reviewed to appropriate academic standards by independent, qualified reviewers.

# Foreword

**John Richardson**

Executive Director,
Australian Institute for
Disaster Resilience



I am honoured to bring you this edition of the journal as the recently appointed Executive Director of the Australian Institute for Disaster Resilience (AIDR). As a long time reader, user and contributor of research in the Australian Journal of Emergency Management (AJEM), I am excited to work alongside my peers on the Editorial Committee to continue to shape and grow this publication's contribution to disaster resilience and risk reduction.

As I step into this role, I am proud to be part of this chapter of AIDR's history as we continue to deliver our trusted knowledge products and services on behalf of the Australian Government. AJEM remains one of our flagship offerings and represents our commitment to advance disaster resilience and emergency management research, evidence, knowledge and practice.

As we face increasingly more complex challenges with the effect of climate change being realised, increasing biodiversity loss, a volatile geopolitical situation, loss of trust in institutions, and the speed of emergent technologies changing the way we work, authoritative peer reviewed evidence has never been more important. Over the course of the next three years, AIDR will take a systems approach, focusing on disaster risk reduction and resilience and on the local level as the foundations for action. We will continue to champion diversity, equity and inclusion.

Within this new contract period, AJEM will reach the significant milestone of 40 years' in publication in 2026. From its humble beginnings as the 6-page newsletter then titled The Macedon Digest, AJEM has remained in continuous publication to today, and is a testament to the network of researchers, authors and valued readers who have propelled the publication's popularity and standing.

The pages of AJEM in 2026 will celebrate the people and ideas that progressed the journal, and I encourage you to reach out to the AJEM Editorial Team with your reflections on the AJEM papers that have shifted your thinking or grounded your practice. For me, it was a line in Paton, Smith and Johnston's 2005 article When good Intentions turn bad: Promoting Household Preparedness that said 'connected communities are prepared communities', a concept which became the basis of Red Cross' Emergency Rediplan.

Mentioning the influential work of David Johnston (and Doug Paton), saddens me at the recent loss of these two research giants who have contributed so much to help us make sense of this complex world we live in. Their work lives on, and AJEM is proud to showcase the new and emerging giants of research in the field. Vale David.

I thank you for your continued support of AJEM and hope you find value and guidance within the pages of this edition.

# Vale Distinguished Professor David M. Johnston

The sudden passing of Distinguished Professor David Johnston on 19 January 2025 has left a huge gap in the lives of all who knew him. David was first and foremost a beloved partner of Carol and father to Joshua and loved family member. He was a proponent of disaster research and emergency management, and the founder of the Joint Centre for Disaster Research at Massey University, Aotearoa New Zealand. He was a friend to many, including colleagues worldwide, and countless students. David loved his work, his family, the great outdoors, and in later years his relationship with Rēkohu/ Wharekauri/ the Chatham Islands. He was a strong supporter of Te Tiriti o Waitangi and actively fostered partnerships with mana whenua. He lived life to the fullest and made the most of every opportunity.

David earned his Bachelor of Science and Master of Science at the University of Canterbury before completing a PhD in emergency management at Massey. In his early career David worked at the Institute of Geological and Nuclear Sciences (GNS Science) (1993-2018), developing a social science research team focusing on hazards and disasters. In 2006 he founded the Joint Centre for Disaster Research (JCDR), a joint venture between GNS Science and Massey University, located at Massey University Wellington campus. As Director he oversaw operation of the centre for nearly 20 years. At the JCDR, David nurtured the careers of numerous emergency management researchers and was a highly sought-after doctoral supervisor, having supervised 35 PhDs and 16 master's projects to completion.

David's research focused on multi-disciplinary theoretical and applied aspects of disasters and emergency management. He was passionate about collaboration and worked with physical and social scientists across organisations and countries. His research on human responses to volcano, tsunami, earthquake and weather warnings, crisis decision-making and the role of public education and participation helped in building community resilience and recovery. David authored or co-authored 260 articles in leading international peer-review journals in the fields of disaster management. He was the editor of the *Australasian Journal of Disaster and Trauma Studies* and was the founding Editor of the *Journal of Applied Volcanology*. He was also a member of the editorial boards for 2 international disaster management journals and was a long-term contributor and supporter of the *Australian Journal of Emergency Management.*

As well as contributions within New Zealand, David was highly engaged in international activities. He led a 25-year research collaboration with emergency managers and researchers in Washington State, focused on earthquake, tsunami and volcano preparedness and had longstanding collaborations with Australian colleagues working in academia and practice. His collaborations provided joint benefits as it allowed the sharing of lessons across countries and the application of solutions to advance disaster risk reduction. In 2016, he became co-chair of the World Meteorological Organization's High Impact Weather Project Steering Group and had a particular passion for advancing citizen-led science for weather events. He also held a role as the Chair of the Integrated Research on Disaster Risk Scientific Committee (2013–15), a program co-sponsored by the International Council for Science, the International Social Science Council, and the United Nations International Strategy for Disaster reduction.

It is without question that David contributed tremendously to the social sciences in hazards, disasters and emergency management. Indeed, his contribution to disaster management cannot be quantified. His vision of the needs of the discipline and his understanding of, and relationships with, communities is something many of us admired and had respect for. His humility, willingness to 'muck in' and be boots on the ground garnered him enormous respect from academic colleagues and peers, and people dealing with the personal impact of disasters.

David was generous, kind, compassionate and humble. His Distinguished Professor Celebration was testament to the esteem with which he was held and the affection others had for him. It has been some comfort that David got to hear at his Distinguished Professor celebration how loved and respected he was. He was deeply moved by the event and the words spoken. David was dedicated to improving the lives of all those affected by disasters and emergencies and there is no doubt he achieved his aim through his own work and the support and mentoring he provided to students and colleagues in JCDR. His legacy is immense and his JCDR team are committed to its continuation.

**Professor Kirsty Ross, School of Psychology, Massey University**

**Associate Professor Julia Becker, Joint Centre for Disaster Research, Massey University**

**Associate Professor Raj Prasanna, Joint Centre for Disaster Research, Massey University**

## Abstract

Emergency management in Australia is undergoing a process of professionalisation. Those who undertake roles in emergency management are often seeking to be recognised as a professional. To support this process of professionalisation, research into the human capacities of the Australian emergency manager was undertaken. Emerging from that research was the concept of disciplines. It was found that discipline-based thinking when applied to the work of those within the field of emergency management provided a way to describe and explore differences in tasks and roles undertaken. Emerging from this analysis was the Emergency Management Disciplinary Spectrum. The Emergency Management Disciplinary Spectrum demonstrates how application of the concepts of discipline, multidisciplinarity, interdisciplinarity and transdisciplinarity can support the previously defined roles of Response Manager, Recovery Manager and Emergency Manager. The Emergency Management Disciplinary Spectrum provides a model from which to explore the development of future emergency management practitioners and professionalisation of emergency management in Australia.


# Professionalism: application of the concept of disciplinarity to emergency management


Peer reviewed



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## Introduction

Emergency events are increasingly affecting Australian communities. For example, the Australian Institute for Disaster Resilience (AIDR) Major Incidents Report (AIDR 2017, p.3) noted 9 major incidents in 2016–17 but noted 30 major incidents in the 2023–24 report (AIDR 2024, p.1). These emergency events affect individuals and the environment in disparate ways. People may be injured or killed and communities may lose people-based capability (e.g. emergency responders), cohesion or vital assets. Additionally, the environment may be damaged and take a long time to recover if it does at all. Communities increasingly expect that those who have roles to prevent or prepare for emergency events, or those who lead response or recovery operations have more knowledge, skills and abilities so that they can prevent, reduce or ameliorate the effects of the emergency on individuals, the community and the environment.

Emergency management in Australia is undergoing a process of professionalisation (Dippy 2022, p.72). Professionalisation of emergency management requires that a range of activities are undertaken that include the development of a body of knowledge that can be applied consistently to emergency events (Yam 2004, p.979). The sources of the knowledge required by the emergency manager originate from a broad range of topics. Increasingly, knowledge is sourced from other occupations and is applied to the emergency event in unique and specific ways. Components added to the education of the emergency manager are taken from sectors including agriculture, business services, community services, property services, forestry, health, information and communications, local government, water, public sector management, sport and fitness, tourism, training and education,

maritime and transport and logistics (Commonwealth of Australia 2018, pp.73–79). The number of packages that support the education of the emergency manager recognises and contributes to the breadth of skills applied across emergency management. The sources of the knowledge required to manage emergency events may be referred to as a 'discipline', for example the discipline of law or the discipline of mental health. It is the application of knowledge arising from those multiple disciplines that is required to manage an emergency event. This paper explores the effects of discipline-based thinking on the management of emergency events.

## Background

Research was conducted to determine the human capacities of the emergency manager in Australia. In developing an understanding of human capacities, the concept of disciplines, and more broadly multiple disciplines, arose. The concept of disciplines explains the sources and application of the knowledge and skills underpinning the human capacities of the emergency manager. The emergency manager is the person who leads aspects of the mitigation of, preparation for, response to or recovery from an emergency event.

Emergency management is not yet recognised as a profession in Australia. Dippy (2020, 2022) summarised the requirements for emergency management to be recognised as a profession with reference to the work of Flexner (2001) and Yam (2004). Professionalism requires, among other attributes, an underpinning body of knowledge. The sources of the human capacities and underpinning knowledge applied while managing emergency events arise from different occupations, knowledge areas or themes. While some of the human capacities identified in the research arise directly from previous emergency events, others have developed from existing knowledge areas or occupations.

When existing knowledge areas or occupations are taught within a tertiary environment, they are often referred to as disciplines (e.g. the discipline of medicine or law). By applying disciplines to the exploration of the human capacities of the emergency manager in Australia, a conceptualisation of the development of the individual is formed that can support the evolution of a person into and within emergency management roles. By applying multi-disciplinary thinking to the sources of the information, it supports development of the emergency management body of knowledge and, thus, the professionalisation of emergency management.

This research builds on previous work by Dippy (2025) who defined the roles of the Emergency Manager, Response Manager and Recovery Manager as an outcome of the analysis of the human capacities of previously undefined emergency manager. The analysis that led to these 3 new definitions is continued with this further analysis of the human capacities emerging from his research.

## Research methodology

The research question examined was 'What human capacity demands should inform the development and appointment of an emergency manager?' To address this question, 20 years of emergency event inquiry reports that had been subject to judicial or semi-judicial inquiries dated between 1997 and 2017 were examined. This 20-year range was selected because many contemporary emergency management principles were in place from 1997. Before this contemporary period of emergency management practice, the response to emergencies was based on cold-war-era civil defence paradigms (Emergency Management Australia (EMA) 1993, p.3). This included military-based command-and-control systems and a focus on nuclear emergency events.

Since 1997 there has been considerable change with the introduction of the AIIMS (AFAC 2017) and similar incident management systems for police and biosecurity agencies (ANZPAA 2012; Department of Agriculture Fisheries and Forestry 2012) as well as the *National Strategy for Disaster Resilience* (Commonwealth of Australia 2011) and the *National Emergency Risk Assessment Guidelines* (National Emergency Management Committee 2010).

Judicial inquiries are those that occur in a legal environment such as Coroners or criminal courts. Semi-judicial inquiries are those where there is enforceable, but outside of a formal court environment, requirements to provide information or answer questions. For this research, semi-judicial inquiries were those with a legislative requirement to answer questions such as a royal commission or another formal inquiry piece of legislation. Judicial and semi-judicial inquiries are only conducted for emergency events that have significant consequences for communities, based in part on the complexity or aftermath. The inquiry reports identified a range of human capacities of the emergency manager. Interviews were conducted with authors of 8 emergency event inquiry reports to uncover other human capacities required by the emergency manager.

The literature review examined broader management concepts in conjunction with the emergency event inquiry reports. The analysis of both theoretical and practical literature distilled and showed themes of the human capacities identified. Targeted interviews with 8 emergency event inquiry authors were analysed and themed together with the literature and emergency event inquiry reports. The interviews provided a broader range of human capacities from which to examine the role of the emergency manager.

A Gadamerian philosophical hermeneutic research methodology was applied to this work (Gadamer 2004, 2013; van Manen 1997). The interviews of emergency event inquiry authors and the examination of the emergency event inquiry reports generated over 15,000 pages of text. Further text was added for analysis from the literature review. The Gadamerian philosophical hermeneutic methodology acknowledges and incorporates the researcher's participation in the field being studied to the analysis of the text being analysed. By rigorously recognising the researcher's world view (Gadamer 2004, p.xi; van Manen 1997, p.197) through the Gadamerian processes of documenting, reflection and reconsideration, changes are captured and acknowledged. The application of Gadamer's analysis methodology allows rigorous and replicable findings to emerge from the research.

This paper presents the concept and application of disciplines that arose from analysis of the literature as well as emergency event inquiry reports and interviews. The application of disciplines allowed analysis of identified human capacities. Discipline thinking applied to the human capacities allowed a model to be developed about how human capacities work together in managing emergency events. The model, the Emergency Management Disciplinary Spectrum, was used as a base to develop people who take on leadership roles in emergency events.

### Ethics

This research was approved by the Charles Stuart University Human Research Ethics Committee, approval number H19294.

## Findings – the Emergency Management Disciplinary Spectrum

The Emergency Management Disciplinary Spectrum represents the identification of disciplines within emergency management and how those disciplines interact with the human capacities of the defined Emergency Manager, Response Manager and Recovery Manager (Dippy 2025). The concepts of disciplinarity, multidisciplinarity, interdisciplinarity and transdisciplinarity form the basis of the spectrum. To reduce confusion in the application of these concepts, the Emergency Management Disciplinary Spectrum demonstrates the application of disciplines in support of the work of the Response Manager, Recovery Manager and Emergency Manager.

Figure 1 illustrates the Emergency Management Disciplinary Spectrum and shows the disciplinary concepts applied alongside emergency management events from the simplest to the most complex. The disciplinary concepts are then aligned with the respective role to which they apply; that is, the roles of Response Manager, Recovery Manager or Emergency Manager.

The Emergency Management Disciplinary Spectrum was developed during this research and places the aspects of disciplines applied by the Response Manager, Recovery Manager and Emergency Manager into a simple model. The model shows that the Response Manager and Recovery Manager may operate across a single discipline, for example, firefighting or recovery. They may also work in a multidisciplinary arrangement with other disciplines such as police. Alternatively, they may use their skills in an interdisciplinary manner; for example, assisting an ambulance crew to extract a person from a location at height. The model acknowledges that there is overlap with the transdisciplinary aspect, in that the Response Manager and Recovery Manager may undertake some tasks that align with those of the Emergency Manager by undertaking ancillary transdisciplinary activities; for example, support for prevention activities.

The Response Manager and Recovery Manager are likely to have developed their initial skills in one discipline; for example, they may have started as a police officer or a social worker. Over time they have developed their skills in that discipline. The Response Manager and Recovery Manager may have lead aspects of their work; perhaps having moved to supervisory or managerial positions in their workplace. As their level of knowledge and expertise develops, it is also likely that the Response Manager and Recovery Manager will start to work with others in organisations, including the other organisations' response managers and recovery managers. By this time the Response Manager or Recovery Manager is developing knowledge to work in a multidisciplinary manner. As the


Figure 1: The Emergency Management Disciplinary Spectrum.

 

human capacities of the Response Manager and Recovery Manager develop it is likely that they will work with other agencies in an interdisciplinary manner. Working together may commence with joint training or exercising opportunities or may occur at an emergency event.

The Emergency Manager role has aspects of both interdisciplinarity and transdisciplinarity. They may be undertaking the interdisciplinary action of bringing multiple agencies together in support of a lead or control agency. Predominantly, the Emergency Manager will be undertaking the transdisciplinary actions to operate across prevention, preparedness, response and recovery and have a large component of working with the community in undertaking their duties.

## Discussion - application of disciplines in emergency management

Interdisciplinarity emerged in this research as a human capacity descriptor for how the Emergency Manager, the Response Manager and Recovery Manager undertake their roles. While interdisciplinarity as a term was raised in one interview, when analysed, the underlying elements arose in all 8 interviews.

To explore and understand interdisciplinarity it is necessary to examine the disciplines that contribute to emergency management. The root of the word 'interdisciplinarity' is discipline, an academically used term for a branch of learning (Macquarie Dictionary 2023). Most people commence a professional career in one discipline or area of study and then branch out to other areas. The Australian Bureau of Statistics (ABS) reported in February 2023 that 35% of recognised professionals in Australia had been in their job for between one and 4 years, with only 10% of those remaining in their job for more than 20 years. The ABS (2023) reported that 9.5% of all employed people in Australia had changed jobs during the preceding year (i.e. 2022). Baum (2022) noted that younger workers may have at least 7 jobs in the first 10 years of their career. For example, many people who study law do not go on to become a practicing lawyer but apply the acquired skills in other occupational areas.

The Emergency Manager, Response Manager and Recovery Manager demonstrate a similar career mobility in that many may have an initial job such as an operational firefighter, a police officer or a community development specialist. Over time, that initial role or job changes and the person may become an emergency manager, response manager or recovery manager often in addition to the original role in which they commenced employment. For the purposes of this discussion, based on the branch of learning definition of a discipline, each function is described as a discipline. For example, the function of operational firefighting (which has firefighters undertake a dedicated course of learning) can be considered a discipline as is the function of operational policing. These existing functions (or disciplines) may co-exist with other functions (or disciplines) such as being an Emergency Manager, Response Manager or Recovery Manager. Co-existence of multiple functions in the work of an individual is an initial example of a person undertaking multidisciplinary work.

A discipline has a set of knowledge, skills, behaviours, training (or education) and outcomes that are unique to that discipline. The operational firefighter has knowledge, skills and behaviours that are mostly different to the operational police officer. For examples of discipline-specific knowledge, skills and behaviours see Ahn and Cox (2016), Bruce et al. (2022) and Jones (2009). In this research, the terms 'knowledge', 'skills' and 'behaviours' encapsulate the individual human capacities of the Emergency Manager, Response Manager and Recovery Manager.

While human capacities may be shared across disciplines, the exact combination and application of human capacities shape the recognisable discipline. As a community, people are comfortable with the well-recognised disciplines of medicine, nursing and engineering and how those disciplines have developed to be recognised as a profession. Similarly, emergency management functions have human capacities. Emergency management applies different combinations of human capacities depending on the task being undertaken. For example, the human capacities of an Emergency Manager working in the application of building codes during the prevention phase may include the ability to understand and interpret complex law. Conversely, a Recovery Manager working with affected communities after may require human capacities that support psychosocial responses to traumatic events.

Medicine and law are recognised as both disciplines and professions. The recognition of medicine and law as professions is reinforced by the legal protections applied to the use of the terms 'medical practitioner' and 'lawyer' (see the *Health Practitioner Regulation National Law (South Australia) Act 2010*[1] and other Australian state and territory equivalents). Emergency management is not yet recognised as a profession. There is no legal protection of the term 'emergency manager' in Australian law.

Many disciplines require a tertiary education program for entry to the profession. For example, medicine and law both require tertiary education for entry to the field. To support this, education programs for professions are referred to as disciplines in the tertiary education context (Macquarie Dictionary 2023). Emergency management does not require a tertiary education for entry.

1. *Health Practitioner Regulation National Law (South Australia) Act 2010* at www.legislation.sa.gov.au/lz?path=%2FC%2FA%2FHealth%20Practitioner%20Regulation%20National%20Law%20(South%20Australia)%20Act%202010.

Many emergency management practitioners undertake vocational training or apply experience built over time to enter the field. Multiple vocational institutions use the term 'discipline' when describing their training programs. However, using 'discipline' by vocational institutions appears to be based on a dictionary definition, for example 'a branch of learning' (Macquarie Dictionary 2023) rather than a formal alignment with a recognised profession. While emergency management may be a training or educational discipline, it is not a recognised profession with a tertiary educational discipline label applied in educational contexts.

The community recognises the outputs of many disciplines. Medicine and nursing have well-known outputs including lives saved after a traumatic event or injury and less well-known outputs such as public health preventative outcomes including food safety, disease tracking and disease prevention. Emergency management has similar known and less well-known outcomes. For example, firefighters respond to fires, but they also contribute to improving building codes and fire prevention through compliance testing and education programs. Police have well-known outputs in the arrest of people suspected of having committed a crime, but less well-known outcomes in crime prevention, management and coordination of emergency events and road accident reduction.

As a person develops in a discipline, their knowledge, skills, behaviours and expertise are expected to improve. The time taken for improvements in knowledge, skills and behaviours will vary between individuals. As this occurs, it could be expected that their outputs as a factor of both quantity or complexity of work will also increase. It may be that with increasing expertise comes a change in roles from team member to supervisor, to manager. The increasing level of activity arises from increased knowledge of the role leads to an increased depth of overall knowledge. Increasing expertise can take a short or long period of time and that time is influenced by the volunteer or career nature of the involvement, training and education undertaken and experience gained. Some of this increase in expertise comes from formal and organisationally required education undertaken by the individual. Some is done by self-development that the individual undertakes in their own time and some by attendance at emergency events.

While this research demonstrated that career or volunteer status should not affect the selection of emergency managers, response managers or recovery managers, the nature of paid employment allows more time to be devoted to skills and knowledge development, which may accelerate skills acquisition. Conversely, skills development periods may be reduced for a volunteer (or career staff member) arriving with an existing selection of skills from a previous career or volunteer experience or education. For example, an ambulance volunteer becoming a police officer will obtain first-aid practical skills that are directly transferable to policing. In addition, communication skills from working with injured and sick people from various backgrounds are also directly transferable to policing roles.

Nicolescu (2014, p.187) stated that multidisciplinarity is the use of more than one discipline. Thus, a multidisciplinary emergency event is one where more than one emergency service provider attends. A vehicle collision could be considered a multidisciplinary event as the disciplines of ambulance, fire and police are all likely to attend. This multi-agency attendance could arise from a single or a multi-vehicle collision and the number of attending disciplines is based on the skills required at the scene, not the number of patients or vehicles.

While the vehicle collision emergency event analogy is a simplified example, the reality of emergency events is considerably more complex. The analogy provides an agency-by-agency example—that is, police attend to undertake policing and the fire service to undertake firefighting. The previous discussions recognising that people have multidisciplinary skills means that emergency events have the potential to be much more complex. Referring to the example of the ambulance volunteer becoming a police officer, their attendance at a vehicle collision could be considered to address the requirements of both a police and ambulance discipline to attend. There is also the complicating factor that some skills are common across disciplines. For example, both police and fire officers are trained in first aid, albeit not to the level of ambulance service members attending the emergency.

To simplify the discussion for the application of disciplines, this paper refers to an individual discipline such as police and fire in these examples. Continuing the simplified emergency event analogy (i.e. without considering that individuals may have multiple disciplinary skill sets) to include different disciplines, interdisciplinarity is where the skills of one discipline are applied to another discipline's area of work. This event may arise where police are searching an area of scrub and require assistance cutting down trees and bush. In this scenario, a rural fire service, which has members with chainsaw skills, might attend. As this is not a fire event, the fire service would not be using their skills for its core business of firefighting but is applying its discipline-based skills in another discipline (police crime scene) environment. Another example of interdisciplinarity is the application of police traffic management skills at a bushfire event. In these examples, the skills of one discipline are applied to support another discipline's core business event. The application of skills from one discipline to another illustrates interdisciplinarity.

Up to this point, the discussion of disciplines has been applied to the response of an emergency service agency and the 'normal' or core business services that they

 

provide (e.g. a police agency and its role delivering operational policing services or a rural fire agency responding to a bushfire). Emergency events are becoming more complex, with compounding and cascading emergency events increasing in number and severity (AIDR 2024, p.22).

This discussion of disciplines has included the actions of an individual in an agency who is most likely to hold a role delivering the core business services of that agency, such as a firefighter undertaking firefighting duties. As a person develops further skills in an agency their role may change. Those changes may lead to them undertake additional roles as Emergency Manager, Response Manager or Recovery Manager (Dippy 2025). It is to this new or additional role of Emergency Manager, Response Manager or Recovery Manager that the concept of transdisciplinarity is applied and discussed.

Augsburg (2014, p.243) described a transdisciplinary individual as having 4 dimensions:

a) 'an appreciation of an array of skills, characteristics, and personality traits aligned with a transdisciplinary attitude
b) acceptance of the idea that transdisciplinary individuals are intellectual risk takers and institutional transgressors
c) insights into the nuances of transdisciplinary practice and attendant virtues
d) a respect for the role of creative inquiry, cultural diversity, and cultural relativism.'

Nicolescu described transdisciplinarity as applying methods within, across and outside the individual disciplines (Nicolescu 2014, p.187). Transdisciplinarity includes aspects of multidisciplinary and interdisciplinary action. When considering McGregor's (2014, p.201) definition that includes removal of boundaries, Mittelstrass's (2011, p.336) application of transdisciplinarity in either a practical or theoretical sense and Von Wehrden et al.'s (2019, p.876 ) inclusion of academic and non-academic, the application of transdisciplinarity to an emergency is complex. The clarifying literature on this is Jahn et al.'s (2012) work showing that transdisciplinarity is an extension of interdisciplinarity. Jahn et al. (2012) stated that transdisciplinarity includes the community in the provision of the service. Coupled with this is Mittelstrass's (2018, p.711) recognition that transdisciplinarity occurs when interdisciplinary actions become a permanent feature of the work. An example of moving from interdisciplinary work to transdisciplinary work is moving from the role of operational fire officer to an emergency manager, response manager or recovery manager, where the work entails ongoing linkages with the community.

Returning to emergency event analogies, an interdisciplinary emergency is a complex event where multiple response organisations must provide their skills in the emergency. This could be a major bushfire where each attending organisation is required to provide specific discipline-based skills. In the bushfire scenario, the fire service/s (a discipline) apply firefighting skills to the suppression and control of the fire. The police service (another discipline) applies traffic management, evacuation and emergency management coordination skills. The fire service exercises control of the event with that control extending to include brigades of its own as well as other fire agencies such as metropolitan or forestry brigades.

For the major bushfire example, the Australian-defined terms of command-and-control are deliberately applied due to their broad use in incident management systems. 'Command' is the internal management of resources in an agency (AIDR 2023a). Command is described to operate up and down in the agency structure. 'Control' is the external management of other agencies at an emergency event (AIDR 2023b) and is described to operate horizontally, from agency to agency, normally by interaction at the agency-lead person level.

Fire service control at the major bushfire also extends across spontaneous resources such as farmer-supplied fire units and other agencies such as police, ambulance, local government, non-government (e.g. the Red Cross) and other entities. For this example, the fire service appoints an incident controller (AIDR 2023), a role included in the defined Response Manager (Dippy 2025, p.68). The person exercising control of the major bushfire, the Response Manager (or incident controller in this example) works within, across and outside (Nicolescu 2014, p.187) their own agency skill set, and within emergency services and the rest of the world (McGregor 2014, p.201). This requires a practical and theoretical (Mittelstrass 2011, p.336) understanding of the capabilities of all of the agencies responding to the emergency event.

What takes this bushfire example from interdisciplinarity to transdisciplinarity is the interaction with the community. For an interdisciplinary event, the management will be provided by the fire service to the community. For a transdisciplinary event, the management will be provided by the fire service *with* the community. The transdisciplinary transition of management may be demonstrated when local knowledge is sought, integrated and applied. There is likely to be an embedded role in the incident management team incorporating local knowledge to the management of the emergency. For example, see Recommendation 14 of the *2009 Victorian Bushfires Royal Commission final report (Vol. 2)* (Teague et al. 2010, p.90) for a discussion on the application of local knowledge.

Another example of transdisciplinary within the bushfire event is the integration and coordination of farm fire units provided by community members (normally farmers). In this case, emergency services organisations are working with the community and are not doing things to the community. Several of the reviewed inquiry reports identified that the coordination of farm fire units was a gap in the response (Schapel 2008, p.241; Teague et al. 2010, p.102). The farm fire units were not integrated into response activities and their actions did not align with and build on the actions of the responding fire services. The movement from doing to, to doing with the community (as raised by these inquiry reports) is the same issue discussed by interviewee 5 (pp.29–30). If the mindset of the Response Manager or Recovery Manager can be changed from one of interdisciplinarity to one of transdisciplinarity, the outcomes are improved.

The Emergency Manager undertakes a range of roles in the prevention, preparedness, response and recovery aspects of an emergency. They are also operating within, across and outside (Nicolescu 2014, p.187) their own agency skill sets, and within emergency services and the rest of the world (McGregor 2014, p.201). They require a practical and theoretical (Mittelstrass 2011, p.336) knowledge of plans, capabilities and capacities of all of stakeholders. However, the Emergency Manager works with the community to achieve the required outcomes. Working with the community is what differentiates their role from interdisciplinarity—the work of the Emergency Manager is transdisciplinary.

Noting the interviews conducted for this research, that the best outcomes are achieved by emergency managers, response managers and recovery managers applying the transdisciplinary approach to emergency events, the work of Augsburg (2014) supports the examination of what is required from a transdisciplinary individual via the 4 dimensions listed previously.

Interviews conducted for this research sought, in part, examples of human capacities that lead to an effective and appropriate response to emergency events as well as examples of human capacities that may be missing during a response. Re-analysing the interview transcripts considering Augsburg's (2014) dimensions of a transdisciplinary individual included comments such as:

> *…someone who has an inquiring mind, who is able to clearly articulate strategy, clearly articulate what his or her expectations might be, and to commence that dialogue.*
> (Interview 1)

> *…the ones that understand that there are interconnections between every aspect of life.*
> (Interview 5)

> *I think he was also someone very committed to the standard operating procedures, and without some of the adroitness that you could see from the responders on the ground, that understood the need to quote 'throw the rule book out.*
> (Interview 2)

> *…the ability to engage with risk and make the decisions with very limited information, limited ability to validate, and very, very compressed time frames.*
> (Interview 7)

The interviewees broadly described human capacities observed at, or missing from, an emergency event. During the interview, they were not able to use the defined terms of 'Emergency Manager', 'Response Manager' or 'Recovery Manager' in their responses as it was their descriptions that led to these roles being defined. The interviewees identified human capacities that align with Augsburg's (2014) transdisciplinary individual dimension (a), in that aspects of an inquiring mind, articulation of strategy, interconnections, adroitness and engagement with risk are an array of skills, or human capacities, align with a transdisciplinary attitude. The interviewees were identifying the need for the Emergency Manager, Response Manager and Recovery Manager role to be transdisciplinary.

The following interviewee statements aligned with Augsburg's (2014) dimension (b), in that they demonstrate risk taking and thinking outside the box:

> *…the challenges, the risks in different areas are absolutely quite different, and a one size fits all approach just simply doesn't work. So it's a matter of understanding what the risk is, making sure that the people who are dealing with that risk are aware of the risks, are prepared to deal with them, practice their response, and don't get caught unprepared which is essentially what happened.*
> (Interview 8)

> *…we haven't got to a point yet where we've ever identified that anyone in one of those positions does not have the technical capacity or a technical background or knowledge of the environment to be able to do the jobs, that's generally not in question.*
> (Interview 6)

The interviewees, without specifically nominating the concept of transdisciplinarity, identified the human capacities of the defined Emergency Manager, Response Manager and Recovery Manager that align with transdisciplinarity. For example, interviewee 8 noted an understanding of risk and an ability to apply that understanding to decision-making, while interviewee 6 identified a level of knowledge that enables emergency activities to be undertaken. Identified human capacities position the ideal Emergency Manager, Response

 

Manager and Recovery Manager in the definition of a transdisciplinary individual. The interviewees were seeking a transdisciplinary approach to the tasks undertaken by the Emergency Manager, Response Manager and Recovery Manager.

Other statements from the research aligned with Augsburg's (2014) dimension (c), in that they described operating across disciplines while understanding the bigger or strategic environment in which an emergency manager operates. The following interview responses illustrate the ability to operate across disciplines using communication skills and applying strategic leadership and planning to the response to an emergency:

> *…didn't necessarily think that that the person who had the highest, done the most courses was likely to be better than the one who had done least because it was the capacity to communicate with other people, including those who had to carry out his directions.*
> (Interview 3)

> *…there is a tendency for these firefighters to actually fight the fire, without understanding the strategic import of other things, such as, all right, if you just fight the fire what part of the fire are you going to fight and what things are you going to protect. There is not enough leadership and not enough strategic planning around what are the most critical assets that need protection.*
> (Interview 4)

Interviewees made comments that aligned with the role of the defined Emergency Manager with Augsburg's (2014) dimensions of transdisciplinary individuals. Some comments were positive, noting actions that had occurred (e.g. interviewee 5 identified an emergency manager who understood interconnectedness in their operating environment). Others were negative, noting gaps; (e.g. interviewee 8 identified an emergency manager who did not identify risk and was 'caught unprepared' in the management of the response). Overall, these comments reinforced that a transdisciplinary individual applying a transdisciplinary approach in an emergency event results in better community outcomes. Thus, a transdisciplinary approach should be applied by emergency managers, response managers and recovery managers.

This examination of disciplines, particularly interdisciplinarity and transdisciplinarity, provides a theoretical framework for the application of disciplines to emergency management. Interdisciplinarity arose in a single interview, but the underlying concept arose in many discussions. The application of transdisciplinarity to the emergency manager role addressed many of the hermeneutic spirals that formed during the research analysis. This discussion on disciplines and the application to the Emergency Manager, Response Manager and Recovery Manager led to the Emergency Management Disciplinary Spectrum being developed.

## Application of the Emergency Management Disciplinary Spectrum to a complex emergency event

The major incidents reports (AIDR 2017, p.3; AIDR 2024, p.1) indicate that emergency events are becoming common, with climate change identified as one reason for this increase. Events are compounding and cascading in that one event is frequently leading to another and multiple events may build on each other. In November 2023, one of Australia's primary telecommunications companies, Optus, experienced a significant failure in operations. The Optus Network Outage was subject to a number of inquiries including an Australian Government Senate Inquiry (Senate Standing Committees on Environment and Communications 2023). The event lasted for less than one day but had flow-on effects for a considerable period and is an example of the compounding and cascading nature of emergencies. The outage is a contemporary example from which to apply the Emergency Management Disciplinary Spectrum to the actions reported in media reports on the day and subsequently (Jung et al. 2023; Thorne 2023).

During the outage, many response and recovery managers undertook additional tasks arising from its consequences. South Australian Department of Health (Health) response managers were managing activities in the health sector including sharing information among medical staff and seeking alternative methods of sharing health test results and contacting patients. Simultaneously health response managers were working in an interdisciplinary manner with response managers from South Australia Ambulance to consider effects on patient flows and information sharing between ambulance and health emergency departments.

The response managers from the Department of Premier and Cabinet in South Australia (the Cyber Control Agency) took on the role of control agency in accordance with South Australia's *State Emergency Management Plan* (State Emergency Management Committee 2013). The Cyber Control Agency (Cyber) response managers were operating in a disciplinary manner to address the cyber effects of the outage. These included reduction of some government telephony services and various government department data outages. These response managers were also operating in a multidisciplinary manner by requesting activation of the State Emergency Centre to share information, response and recovery actions with other government agencies. Cyber response managers were also working in an interdisciplinary manner with various government information technology and

telecommunications staff to develop short- and medium-term resolutions to various affected systems.

Parallel to the actions undertaken by the numerous response managers, many recovery managers in South Australian agencies and organisations were examining the incident and preparing individual plans for implementation if required. Recovery managers were seeking information from organisations and stakeholders as to the nature and scope of potential recovery needs and required structures across the community. Recovery managers from multiple organisations were sharing information about the effect on their interdisciplinary stakeholders to identify further needs.

At the same time as the actions of these response and recovery managers from government and non-government agencies were being undertaken, many emergency managers were undertaking transdisciplinary actions. The emergency manager from the Cyber Control Agency was applying the response plan that they had developed in their prevention and preparedness activities prior to the event. A Cyber Emergency Manager was also sending information to the community to provide advice and reassurance as to the actions of government for this event. South Australia Police emergency managers had activated the State Emergency Centre and were providing public information and including recovery considerations in whole-of-government planning.

This event was associated with many compounding and cascading issues. The delivery of information from health agencies to affected communities was compromised. The emergency alert system used by emergency services organisations to provide information was hampered because subscribers using the Optus network did not receive critical information. Alternative means of sharing public information and warnings were being explored and preliminary advice was given to the community in case another emergency event occurred (e.g. a bushfire) that required dissemination of information. In this complex example, the various disciplinary actions were applied. Response and recovery managers applied disciplinary knowledge and skills to their activities. They also applied multidisciplinary and interdisciplinary skills and actions to ensure that information was provided to other agencies and the community and that actions were taken. The emergency managers from multiple agencies and organisations were working together in a transdisciplinary manner to ensure that community communication was underway and that recovery considerations were being addressed.

The Optus Network Outage was not included in this research because its date of occurrence did not fall within the selected date range and it has not yet been subject to a judicial or semi-judicial inquiry. The outage does, however, provide a contemporary example to explore the application of the Emergency Management Disciplinary Spectrum to a broad-ranging, complex event that also had aspects of compounding and cascading consequences.

## Foreseeable issues and roadblocks

The concept of disciplines, including the aspects of interdisciplinarity, multidisciplinarity and transdisciplinarity has not previously been extensively applied in emergency management. While ‘discipline’ in tertiary academic education refers to a branch of learning, it does not appear in the nomenclature used in the emergency management field. This means that implementation of the Emergency Management Disciplinary Spectrum requires a similar range of activities and work as the implementation of other emerging concepts in emergency management such as use of the terms of Response Manager, Recovery Manager and Emergency Manager (Dippy 2025). Activities required include the expansion of the scholarly body of knowledge, presentations to research and practitioner forums and conferences, identification of change champions and ongoing discourse across practitioner and academic forums.

The use of the Emergency Management Disciplinary Spectrum and its components will allow for the conceptual separation of the various parts of the work of the Response Manager, Recovery Manager and Emergency Manager. The Emergency Management Disciplinary Spectrum as a concept and model supports academia in the description and development of the human capacities and tasks undertaken in these roles. The implementation of these concepts requires a combination of concurrent tasks and seeks emergency management practitioner and academia agreement and support. As emergency management is not yet a profession, agreement on these concepts and definitions will advance the professionalisation of emergency management. There is additional work to provide stakeholders with opportunities to contribute to, discuss and concur with the concepts and models proposed if they are to be universally agreed and applied.

## Conclusion

This research explored the concepts of discipline, interdisciplinarity, multidisciplinarity and transdisciplinarity as they apply to an emergency event. Although the concepts arose from an observation made by an interviewee, further analysis showed underlying parts existing across the 8 interviews conducted. The discussion and the function of disciplines to explain the work of the defined Response Manager, Recovery Manager and Emergency Manager led to the development of the Emergency Management Disciplinary Spectrum, a model that displays the concepts in a method that is simple to understand. The benefit of the Emergency Management Disciplinary Spectrum is not the diagram itself, but the concepts that arise in applying the spectrum.

 

The Emergency Management Disciplinary Spectrum demonstrates and supports the understanding of disciplinary roles in the emergency management field. Developing an understanding of disciplines in emergency management improves the understanding of the various knowledge, skills and abilities—the human capacities—being applied by the Response Manager, Recovery Manager and Emergency Manager.

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# Information and communication for disaster resilience

Peer reviewed

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## Abstract

The provision of relevant information and communication to communities during a high-hazard event remains a consistent challenge for the emergency management sector. While there is diversity of information sources and mechanisms to disseminate content to the public, research indicates there is still an unmet demand for timely, local, highly specific hazard information. Post-disaster surveys conducted following 3 natural hazard events in north Queensland between 2019 and 2024 show that while respondents accessed a wide variety of information sources and were generally satisfied with the quality of information, there were still several perceived gaps. During these hazard events, community members expected to readily access detailed, consistent and localised information to reduce uncertainty and assist decision-making. Telecommunications and power network failures caused by the hazards revealed over reliance on information technology as the primary source of communication for many households. Lessons learnt from such experiences can improve our understanding and practical approaches in future events.

## Introduction

The Centre for Disaster Studies (CDS) at James Cook University in North Queensland has over 4 decades of knowledge and experience in providing guidance to emergency managers in areas of community hazard awareness, preparedness and hazard response (CDS 2024). A key to understanding community behaviour during any event has been to conduct post-disaster surveys within a few days or weeks after a disaster has occurred. This research is designed to review experiences at the household level and identify any gaps in knowledge or practice. As public information and communication was identified as a central area of concern in Australia's Royal Commission into Natural Disaster Arrangements (Commonwealth of Australia 2020) and similar public enquiries (IGEM n.d.), CDS post-event surveys include specific sections about sources of hazard and emergency information, communication as well as advice and support immediately before, during and after the disaster.

In using uniform survey questions over multiple events, post-disaster research is able to identify and report on the sources of information used by the public to enable emergency managers, forecasters and government officials to develop and improve hazard messaging, warnings and support services. Central to both the post-disaster surveys and the feedback to professional stakeholders is community perception, understanding and interpretation of information and warnings. A review of existing literature indicates the increasing complexity in managing prolific information sources for effective hazard communication to affected communities and the value of learning from past events.

This paper draws directly on the experiences of local respondents following 3 natural hazard events of the 2019 monsoonal floods in Townsville, Cyclone Jasper and subsequent floods in Far North Queensland in December 2023 and the effects of Cyclone Kirrily on the Townsville population in January 2024 (see Figure 1).

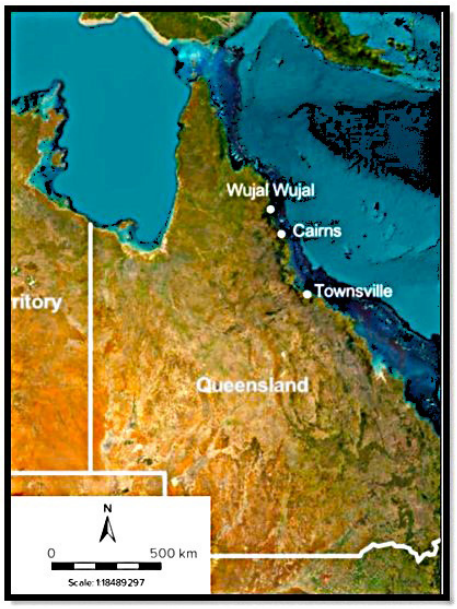


Figure 1: Locations along the Far North Queensland coastline of the monsoon floods and Tropical Cyclone Kirrily (Townsville), Tropical Cyclone Jasper (Wujal Wujal) and associated flooding (Cairns).

Queensland is considered the most disaster-prone state in Australia and such hazard events are not unusual. Field-based observations were used and data were collected and analysed from the online post-disaster surveys targeted at the household level (with minor modifications of words appropriate to the details of the event). A significant emphasis was placed on questions designed to understand people's needs and use of information and communication from a range of organisations and service providers. Additionally, respondents were provided the opportunity to give open-ended comments on communication flows and problems as well as suggestions on what might be improved in the future. This research methodology proved an effective way to draw out lived experience, variable perspectives and community expectations.

## Information and communication themes in the research literature

Contemporary emergency and disaster management literature reveals several common themes regarding the provision of hazard information and communication to the community. While there is some overlap, prevailing issues include the multiple channels of communication; engaging all the community with clear, accessible and tailored messaging; the demand for timely and accurate communication and building trust and transparency. Research clearly indicates it is not just about the provision of information but ensuring that the content is effectively understood, trusted and acted on by all parts of the community.

### Technology and multiple information platforms

The first decades of this century reflect a period of information explosion driven by information technology, the internet, social media and an integrated globalised network across societies. Beyond traditional broadcast communication channels such as newspaper (print), radio, television and landline telephones, there is now a multitude of media platforms including smartphones, text messaging and portable, wireless internet access. Additionally, remote sensing technologies and Internet-of-Things devices such as weather sensors, provide real-time data (Krichen et al. 2024). The abundance and availability of so many channels suggests the capacity to provide information across all of society, answering to all and any needs, but the availability is neither geographically nor socially equal. There are gaps in terms of access, which, coupled with a perception that there is additional unstated information out there, means that communities still demand more (Eriksson 2018). The challenge for emergency managers and forecasters has become increasingly complex and difficult as expectations increase to make greater use of technologies to provide precise, timely and accurate information. In an emergency or disaster event this is made acute when people need information about their specific location and understanding. There is a greater urgency and attention during an event that multiplies the demands and responsive actions of the community that want relevant information to decide about preparation, safety and recovery activities.

### Proactive and targeted messaging

In appreciating the inherent constraints of existing systems and resources during an event, a common approach has been to increase proactive education, awareness and resilience campaigns and to pre-develop clear, accessible and tailored messaging. Premised on simplicity and cultural sensitivity, emergency managers have focused on tailoring messages to the needs of parts of communities identified as 'vulnerable' groups on the basis of characteristics such as linguistic, socio-economic and demographic contexts (Clarke et al. 2024; Maddock 2021; Howard et al. 2017), ethnicity and culture (Eriksson 2018) and gender diversity (King 2022). Such messaging and information are especially important for events that may necessitate evacuation (Turner and Couture 2024; Clarke et al. 2017). Effective hazard-specific evacuation messaging requires targeted demographics, culturally appropriate messages and, in Australia, the responsibilities and jurisdictions of local government councils. A recognised barrier to a targeted approach is accommodating people's preferences for different communication sources, styles and channels (Perera et al. 2020). Reaching 'vulnerable' populations and marginalised groups requires information to be provided in accessible formats and in ways that accommodate those needs.

 

### Engaging local communities in emergency information and communication

As greater quantities and details of information are posted online via websites and through social media, there is a continued need to activate information that is presented in official or static advice formats, through direct communication and social engagement (Clarke et al. 2024; Atkinson 2023). The flow and explanation of information is more important than its static existence however well crafted and targeted it may be. Within communication processes, newer formats and platforms like social media, may not be that different from existing communication and education practices (Eriksson 2018). Beyond passive exposure and incidental knowledge, active learning requires awareness, curiosity and understanding. Even with the proliferation of digital and social media, the essence of good communication (connection and information exchange) remains unchanged. It is the medium through which it occurs that has undergone a revolution (Anuashok et al. 2024). Rather than just being provided information, communities should have the opportunity to ask questions, provide feedback and engage in discussions with authorities. Two-way communication builds trust and understanding (Yell and Duffy 2018; Ogie et al. 2022). Eriksson (2018) argues that emergency managers should prioritise traditional media sources in times of disaster as well as using social media effectively. Purohit et al. (2025) argue that a hybrid approach, combining traditional and social media, is essential for comprehensive and effective emergency communications. Ames and Hewson (2019) advocate use of warnings and weather prediction from both formal and informal/unofficial sources.

In recognising that information generated by the public can be locally based and location-specific, it may lack relevant hazard information at the equivalent scale, despite having detailed knowledge of the local community. Ames and Hewson (2019), Rondeau and Deans (2023), Maddock (2021) and Atkinson (2023) all suggest that there is an increasing demand and expectation from people for detailed hazard information at the local level. To enhance hazard resilience, information and communication must be oriented around the local community. Information is intended to make people safer so it is necessary to engage and empower the active use of information at the community level (Atkinson 2023; Brataas 2018). Maximising the use of community-based knowledge during a hazard event requires leveraging local expertise and trusted networks to disseminate timely, verified information and contest misinformation (Kankanamge et al. 2020).

### Establishing credibility and community trust

Building trust and transparency within communities remains integral to effective disaster management (Fakhruddin et al. 2020). Regular, consistent and transparent communication from trusted authorities builds confidence. This is particularly important during the response phase when the community may be anxious or uncertain. Communities are more likely to respond to hazard information when they trust the source (Duckworth 2022). Establishing long-term relationships between authorities and communities is therefore essential for effective communication during events. Hazard communication and messaging should also adapt as the situation evolves. As emergency and disaster contexts are dynamic and often unpredictable, it is important to keep communities updated with the most current information. Credible, relevant, up-to-date and accessible information allows people to make informed decisions.

### Risk perception and variable needs

This research suggests that it is equally important to appreciate that not all members of the community perceive and act on information and warning messages in the same way (Fakhruddin et al. 2020). In addition to socio-economic, demographic and cultural diversity, individuals within communities and homogenous groups demonstrate highly variable risk appetites. Scovell et al. (2019) argue the importance of recognising highly variable attitudes and appetites towards risk. They use a scaled range from 'proactive pessimists' to 'deniers', like the long-used categories of 'risktakers' through to 'risk-averse' that have been employed by emergency managers. For information, messaging, warnings and communication there is no one-size-fits-all approach. As information technologies expand and proliferate the choices, means of delivery and demands and stresses on communities, as well as emergency managers and forecasters, has become a critical and complex problem.

## Research context

As the emergency management sector develops and trials different communication tactics and approaches, direct experience is an opportunity to explore challenges and issues in hazard communication and information. Using 3 disaster-declared events in North and Far North Queensland over a 5-year period, community-based research was conducted to investigate preparedness, personal experiences, hazard effect and access to information and guidance of affected people. Each of the weather events chosen occurred within the tropical Queensland wet season when cyclones, storm surges, floods and rapid inundation are historic hazard risks. As such, communities in these areas are considered to possess high levels of preparation and experience. Using a replicated online survey instrument provided the opportunity to explore any variations in time, in

the different hazard contexts and variable affected populations. The Australian Bureau of Meteorology (BoM n.d. a, b) and Queensland Reconstruction Authority (QRA 2024) provide information about these events.

### The monsoon flood event 2019

In January to February 2019, extensive heavy rainfall from a monsoonal trough and associated low-pressure system fell over north Queensland. Townsville airport recorded 1,260 mm over 10 days while some areas within the city council area experienced over 2,000 mm. Rivers flooded in the lower Burdekin and Herbert catchments, including the Ross River that crosses the central urban areas (QRA 2024). The Ross River Dam, which functions as flood control and reservoir for the city, reached 248% of its capacity by 5 February. Mitigation processes saw the dam gates opened from 1 February that resulted in flooding of some suburbs downstream and the need for extensive evacuations of residents. Outlying communities also experienced localised flooding. Around 3,300 properties were estimated to have been damaged by floodwaters and 6,500 insurance claims were lodged (AIDR 2019). The event was estimated to cost Townsville residents, businesses and the council $2.5 to 5.2 billion in clean-up and repairs (IGEM 2019).

### Tropical Cyclone Jasper 2023

Tropical Cyclone Jasper developed in the northern Coral Sea in early December 2023 and crossed the Queensland coast as a Category 2 system in the vicinity of Wujal Wujal in the evening of 13 December 2023. It progressively weakened over land and stalled for several days as a low-pressure system. Persistent heavy-to-intense rain fell over the north tropical Queensland coast area including river catchments that were already saturated. This resulted in an extraordinary flooding event (BoM n.d. a). Some Far North Queensland communities and localities were completely inundated, which created large-scale isolation, widespread power outages and significant effects to agriculture, animal welfare, small business and tourism (QRA 2024).

### Severe Tropical Cyclone Kirrily 2024

Tropical Cyclone Kirrily crossed the Queensland coast approximately 50 km north of Townsville in Far North Queensland as a Category 2 system late on 25 January 2024 (BoM n.d. b). There was minimal damage to homes and buildings but over 65,000 residents experienced power outages, localised flooding and heatwave conditions (QRA 2024). Over the following week, ex-Tropical Cyclone Kirrily generated intermittent gale-force winds and significant rainfall over the tropical coast that isolated inland Queensland towns and homesteads.

Flood-affected households left damaged contents in streets for council collection.

Image: Yetta Gurtner


Localised flooding in Mossman, Queensland closed roads and isolated communities.

Image: Yetta Gurtner

## Online household survey research method

Surveys have been used by CDS extensively in affected communities throughout Queensland and other locations

 

in Australia, for almost 30 years (CDS 2024). Each survey is modified in relation to the place, time, event and specific issues identified by media and response organisations. However, the primary instrument has become quite standardised. This consistency allows for comparative data collection and identification of any relevant trends or emergent themes.

A mixed-methods research approach was used for each of the events used in this study:

- An online survey with people in affected communities that takes approximately 15 to 30 minutes to complete. Most questions are factual with a very short answer that avoids accounts of stressful situations or requires a selection from suggested responses. Questions allow for open-ended comments. The only personal questions are factual and straightforward and based on Census characteristics.
- Direct observations by researchers of affected locations related to disaster effects collected from emergency management and local government organisations to provide context to resident responses. This is ongoing during the time of the surveys.

Apart from using the results of surveys to analyse community experiences of warnings, preparation and awareness, the researchers also contribute to methodological analysis of post-disaster studies (Cottrell and King 2010; Gurtner et al. 2008).

The online surveys for each event were distributed primarily via local community-based social media groups on Facebook that was supported by localised online and radio promotion. Consistent with previous research, the questions covered the following themes:

- household preparedness (kits, plans, insurance)
- effects of the event and evacuations
- sources of event information and ratings of perceived credibility (and misinformation)
- demographic data.

Initially, a brief introduction, overview of the study and link to the survey was sent to relevant online group administrators requesting permission to distribute the survey. The approved social media post encouraged people to share the link to anyone who may have experienced the event to help improve communication in future events. Established contacts from the Townsville Council community disaster recovery committees were invited via email to promote the survey throughout their networks. Paper-based versions of the survey were available on request and at several local community hubs. None were returned for inclusion. As the intent of the survey was to accurately capture and document lived experiences of disaster events, surveys were posted 2–4 weeks after each event and closed 4 weeks later. As survey responses are anonymous, there is no mechanism to determine if respondents had completed previous surveys.

It is appreciated that online surveys have a responder bias that may exclude portions of the community. In a post-disaster context, online surveys remain one of the simplest and effective mechanisms for broad-based rapid distribution and ease and speed of response. Respondents self-nominate, self-assess and report their experiences without external pressure and are free to withdraw or choose to not submit a response. Given the understanding of how communities access and receive information and communication remains one of the primary purposes of these surveys, data and feedback collected can be used to identify common themes and issues.

### Ethics statement

This study received James Cook University Human Ethics approval number H7279 and H9365.

## Results

There were 705 responses to the survey received between 15 February and 15 March 2019. This number may reflect the significant and widespread effects of the monsoon flood event. As cyclones Jasper and Kirrily occurred within the 2023–24 tropical monsoon season, those surveys were distributed concurrently and 267 responses were received; 209 relating to Cyclone Kirrily and 58 relating to Cyclone Jasper. The online surveys for both cyclone events were available from late January until 1 March 2024. All 3 surveys took an average of 15 minutes to complete and achieved a completion rate of around 80%. Given that the populations of Cairns and Townsville ranged from 175,000–200,000 at the time of the events, survey response results are considered more informative than statistically representative of those populations.

### Household preparedness and event effects

In terms of household preparation, of the survey respondents affected by the 2019 floods, 51% indicated that they were adequately prepared and 65% indicated that they had a disaster kit. In comparison, in the cyclone events, respondents indicated that they felt prepared (over 85% had disaster kits) but that they were not adequately prepared. Associated weather hazards during the cyclones were storm surge, rain, wind, inundation and high humidity. All 3 weather events resulted in widespread power outages but, in the context of Cyclone Kirrily, the excessive humidity and hot weather also led to heatwave conditions. Respondents who experienced power loss reported other issues like lack of sleep, anxiety, fatigue and feelings of isolation.

*Excessive heat and humidity without even a fan was almost impossible to withstand. I contemplated booking a hotel just to get a few hour's sleep. I remember feeling absolutely overwhelmed and helpless and physically and emotionally exhausted.*
(Cyclone Kirrily respondent)

Consistent with the monsoon event, flooding and evacuation was a significant issue in some areas with the intense rainfall following Cyclone Jasper. In 2019, only 38% of respondents had an evacuation plan, however, this level had increased to 46–58% of respondents in 2023–24. Few respondents reported that they evacuated during any of these events despite a range of evacuation advice messages being issued. Both voluntary and directed evacuations were issued to local communities, however, many respondents indicated these messages were confusing or were received too late for them to act on.

*[I] evacuated due to close proximity to Aplin's Weir. Text messages were vague and ambiguous and other information provided by local government was the same.*
(2019 monsoon event respondent)

*By the time I realised that the situation described in the emergency warning text applied to me, I could not self-evacuate because the flood waters rose rapidly.*
(Cyclone Jasper respondent)

For homes inundated, the effects were highly variable. Respondents reported minor to significant damage to their dwellings and contents, while others lost everything. Many respondents said they were forced to relocate. A Cyclone Jasper respondent said, 'I was evacuated from my house because it was flooded by over a foot of sewage-contaminated water'.

In contrast to the effects of localised flooding, the lower classification and wind speeds of each cyclone as they crossed the coastline resulted in a loss of power, accumulation of debris and damage to vegetation. As most of this damage was small-scale and minor, public infrastructure and transportation networks were restored to urban centres within a relatively short timeframe. Restoration of these services was delayed in peripheral suburbs and remote communities. Due to extensive infrastructure, network connections and safety considerations, restoration of residential power was variable.

*Damage was minimal, fences and trees etc, but the impact of being without power for 6 days and travelling in and out to work during this time had a major impact on our family.*
(Cyclone Kirrily respondent)

Reported insurance rates in 2023–24 increased by over 5% compared to 2019 (75% to 83%). Survey open-ended responses showed that many respondents only had contents insurance (i.e. no house or building insurance). While insurance cover for property and possessions is commonly considered as a recovery mechanism, shortfalls in coverage only becomes evident when people make a claim. Being under-insured can reflect unaffordability of insurance premiums and the stress that underinsurance can cause.

## Hazard information and communication

A prominent issue identified during the tropical cyclone events was a failure of the telecommunication systems. With increased reliance on and direction to access online information (e.g. via Bureau of Meteorology or local council disaster dashboards) the loss of local mobile and telecommunication connectivity meant that some communities had no access to online communication or information for days; this included text-based alerts. When combined with the loss of power, a number of respondents said that they felt frustration and abandonment.

*It would have been ok if people would have understood that once you lose power you lose access to everything but a battery-powered device to listen to the news. All the information on the internet isn't accessible.*
(Cyclone Kirrily respondent)

Minor roofing damage caused by high winds during Cyclone Kirrily.
Image: Yetta Gurtner

 

*No power for a total or about 4 days, no internet for 5/6 days, flooding to the door of house (not in the house), not able to leave house due to flooding, not wanting to leave the house due to worry, some roof damage, stress and anxiety.*
(Cyclone Jasper respondent)

Given the importance of accuracy and credibility in disaster information, a significant part of the surveys focused on where respondents sourced information from before, during and after the event. The surveys included a range of official authorised sources and other established alternatives and respondents could select more than one answer. While there was a small degree of variation, respondents indicated similar information access patterns for each of the hazard events. Facebook was used more significantly during the 2019 floods. The floods developed relatively slowly and generated uncertainty such that Facebook may have provided reassurance and contact with other friends and family who were anxious about the impending disaster. The survey results showed a trend away from traditional media sources and Facebook, government websites (including Bureau of Meteorology) and the local Disaster Management Dashboard where the main sources of information selected from the survey answer list. Radio rated just above 10% in all events, but the data did not show whether this was throughout the event or after access to power and telecommunications were lost.

Questions in the surveys focused on the different types of information sources. These covered official information sites, Bureau of Meteorology products, other weather-based information sources, media outlets, non-government organisations and community-based groups. After each question, respondents were requested to identify the information sources they personally accessed and to provide a rating on how they perceived the information provided. Each rating was based on 4 categories of 'accurate', 'up to date', 'useful' and 'trustworthy'. Within each category, respondents could rate information on a Likert scale of 'completely', 'very', 'moderately', 'somewhat', 'not at all' and 'not applicable'. For all sources of information of sites, groups, official, media and informal (i.e. not from an official/authorised source), the majority of responses in all 3 surveys and on all 4 categories of

Table 1: Primary source of information as listed on the survey.*

| Survey question: 'What was your primary source of information regarding the flood event (you may select more than one option)'. | 2019 floods (%) | Cyclone Jasper (%) | Cyclone Kirrily (%) |
|---|---|---|---|
| Television | 7 | 5 | 6 |
| Print media (newspaper) | 0.7 | 1 | 0.6 |
| Facebook | 26 | 17 | 17 |
| X/Twitter | 1 | 0.6 | 0.1 |
| Instagram | 0.2 | 0.6 | 0.5 |
| Other social media platform (e.g. Flikr, YouTube, blog) | 0.4 | 2 | 4 |
| Media website | 3 | 3 | 4 |
| Government web site (includes Bureau of Meteorology) | 15 | 17 | 20 |
| Local government Disaster Management Dashboard | 16 | 14 | 13 |
| Community website | 2 | 3 | 3 |
| Other Internet source | 1 | 0.6 | 2 |
| Weather-based app (via smart device) | 5 | 7 | 10 |
| Radio | 11 | 12 | 11 |
| Friends/family | 7 | 9 | 6 |
| Telephone support service/hotline | 1 | 2 | 0.3 |
| Other responses | 3 | 7 | 6 |
| **Total percentage** | **100** | **100** | **100** |
| Total number of responses | 1,909 | 175 | 616 |

* All numbers above 1% are rounded to nearest whole number.

ratings, the highest frequency responses were for 'very' and 'moderately' ratings. Very few responses were for the 'somewhat' and 'not at all' ratings.

Open-ended comments provided insight into personal opinions.

> *Social media was the least accurate when people would speculate on the extent of the information. The silliest people often have the most to say on Facebook, by speaking their thoughts when it is not necessary. Government websites were the most accurate. Bom.gov.au was excellent in monitoring the water levels of the local creeks and rivers, while giving live updates of creek and river water levels several times per hour as required.*
> (2019 monsoon respondent)

> *There seemed to be much hype and scare lingering on mainstream media. Govt updates were balanced and helpful. The BoM's updates need to be more mobile friendly and accessible [using] plain English. Townsville council - recommended crisis support and evacuation centres not applicable to island - as the ferries were down. Police update was useless and after the fact. The local MP used the opportunity to try and score political points rather than help community-based supports were the most useful and trustworthy.*
> (Cyclone Kirrily respondent)

Survey results showed that the primary reasons people sought hazard information varied depending on the event context. The most common reasons identified in each of the surveys was to access warnings, monitor the event and local impacts, personal preparedness and to track the cyclone or the event. Consistent with the nature and effects of rapid inundation, responses from the 2019 monsoon and Cyclone Jasper showed a desire for information about sandbagging; flood inundation maps; dam, river and waterway levels and evacuations. Information regarding emergency response, recovery, volunteering and donations was sought for more in the more severe events.

Although respondents elaborated in the survey comment sections about finding flaws and recommending improvements to sources of information, respondents were generally satisfied with the information that they received. Overall, respondents indicated that they were very or moderately satisfied with the accuracy, timeliness, usefulness and trustworthiness of information sources. It is important to note that this should not be interpreted as complacency or blanket satisfaction because respondents rated the information they had received. Respondents were able to cite many flaws in some detail as well as occasions of omissions and misleading information.

## Perceptions and understanding of information

Each of the post-disaster surveys provided opportunities for respondents to add comments and advice. Question 21, 'Did you come across any inaccurate, conflicting or misleading information regarding the hazard event?' resulted in 412, in some cases quite lengthy, responses. These statements were analysed using content analysis and coding for themes and congruence. Given the similarity of themes across the 3 surveys, the comments were collated and are summarised in Figure 2. Word clouds generated from survey data offer a visual representation of information by emphasising the frequency of words or phrases provided by respondents. Word clouds are a simple but effective way to represent large volumes of qualitative data, particularly responses from open-ended questions. The size of the word relative to other words in the word cloud corresponds to how often it appears in responses (its frequency), with words mentioned more often appearing larger. In this way, word clouds show common themes to help identify main concerns, priorities or topics of interest and make it easier to extract insights and understand the responses.

While it is evident from the word cloud for this study that there are discrepancies and issues identified, the majority of respondents left question 21 blank. Similarly, there were many supportive and positive comments provided at other questions. Detailed analysis of the open-ended comments from question 21 particularly showed a lack of local or specific information. Respondents indicated a vagueness or blanket messaging and made criticisms of media information being Brisbane- or southern-centric (i.e. southern Queensland). Respondents also expressed a perceived lack of leadership during the periods of great uncertainty. Facebook was rated highly and also heavily criticised for publishing rumours. In a general sense, but also specifically targeting commercial media and poor information in local newspapers, responses referred to hype, misinformation, hysteria and exaggeration.

The final open-ended question in the surveys requested comments on any aspect of information, warnings or evacuations for the event that could be improved. Figure 3 word cloud shows a high degree of overlap with themes identified from question such as information, people, council and flood. However, there is an emphasis on warnings and evacuation. From the detailed responses, there appeared to be a consistent lack of understanding regarding the locations and purpose of evacuation centres. Uncertainty also existed related to shelter messages. This was very evident on Magnetic Island (close to the coast at Townsville) during Cyclone Kirrily. Respondents indicated that to help them decide if and when to evacuate, they needed updated flood and storm surge mapping. This was particularly in reference to content that was available on the Townsville Council

 


Figure 2: A word cloud of collated open-ended responses to question 21, 'Did you come across any inaccurate, conflicting or misleading information regarding the flood event?'.

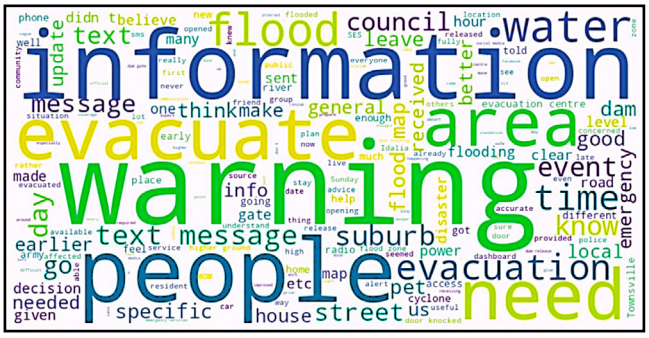


Figure 3: A word cloud of collated open-ended responses to question 29, 'Please comment on any aspect of information, warnings or evacuations for this event that you believe could be improved'.

disaster dashboards. Comment from the survey indicated that flood maps needed to be user-friendly and clearly readable. Some respondents were also critical of urban development that had occurred within flood zones. Evacuation-specific issues such as timing, procedures and inconsistency in warnings and refuge locations indicate a need for improved public information and explanation on these topics. Some respondents felt that evacuation should be compulsory and enforced. The issue of animal and pet evacuation was reported extensively as a barrier to household evacuation. Door knocking to inform residents of evacuation messages was also considered confusing and inconsistent by several respondents.

## Discussion

This survey data are hazard event and context-specific, yet the results add value to the understanding of how people receive and perceive information during a disaster event. Consistent with themes identified in existing literature, survey responses highlight the difficulties of messaging and information consistency when content is of variable quality and available from many sources and platforms. Similarly, there was a strong demand and expectation for more localised, timely and accurate information. Identified issues of misinformation, misunderstanding and miscommunication, credibility and trust continue to be a persistent challenge for effective community-based communication and information before, during and after any emergency event.

### Sourcing hazard information

The advance in information technologies and usage since 2000 has presented more choices, more access, more information and more sources of information. Despite this proliferation of resources and content, the greater range has not necessarily improved understanding nor ameliorated uncertainty, risk or threat. During a hazard event, the need for information, advice and guidance is typically more urgent and immediate, yet, with so many sources, there is also a need to evaluate the accuracy and reliability of information for effective decision-making.

While the surveys did not assess technological advances in hazard monitoring nor the methods people use to access information, the data reflects the diversity of information sources used. Established means of information sharing such as traditional media, friends and family were evident, however, many respondents indicated seeking information online and using social media. Although there was a reasonable level of trust and satisfaction of messaging and information, the loss of power and telecommunications for some households reinforced the need to include battery operated AM/FM radios in disaster kits as a redundancy option. Having a variety and choice of information did not necessarily equate to a better understanding or reduced level of uncertainty. The high information load with apparent inconsistencies in content requires a greater degree of time and consideration to evaluate effectively.

### Providing the community with local information

Despite the survey results showing an increase in some aspects of preparedness such as disaster kits, evacuation plans and insurance, respondents wanted better communication and information during the event. Because technology is available, respondents wanted, and in many cases expected, information to be specific to their suburb, even to their own property. It was beyond the scope of this research to investigate the value of targeted, tailored messaging without detailed demographic data. However, it was evident that respondents wanted more information that was local, frequent and, underlying these needs, consistent. Posting information on websites is passive. Communication of information needs to be made active by sending it directly to people who need it and, ideally, by enabling those people to respond in some way.

The results showed an aversion to remotely generated, one-sided, commercial and social media hype and there was a clear requirement for localised, relevant,

hazard-specific information. Effective messaging and information should endeavour to include local involvement from an established and credible source such as Neighbourhood Watch. Respondents wanted advice and texts to be specific and tailored to their local needs with useful recommendations. This need was evident in each of the hazard events where respondents wanted information about where sandbags and sand were available locally as well as how to effectively sandbag properties against rising waters. Local radio stations were recognised as able to provide this type and level of content, however, improvements were recommended. While elements of Facebook and social media were associated with exaggeration and spreading rumours, survey recommendations were that Facebook pages of governments, councils and organisations must provide regular, accurate and updated information.

### Timely, accurate and user-friendly information

Even though the Bureau of Meteorology was held in high regard by respondents, it was also criticised for its variability of predictions, tracking maps, cyclone intensity and, in the case of Cyclone Jasper, a cyclone focus that ignored the consequent flooding. The Bureau's website content, information provided and tracking maps were criticised as being overly reliant on where the centre line of the cyclone track was and not conceding the high degree of forecast uncertainty. Respondents called for up-to-date information on the potential impact of winds and rain rather than an emphasis on the timing of a cyclone's centre crossing the coast. It was suggested that the frequency of official information updates should be more frequent, even half hourly.

The Townsville Council disaster dashboards were also criticised for an information time lag. Respondents cited council information shortcomings and found that both flood and storm surge zone maps were confusing. Comments were that official messages need to be clearer, understandable and more mobile friendly. The 2019 monsoon flood information prioritised dam failure. The survey responses identified issues regarding information about road closures (especially related to evacuations) recovery and garbage collection. Specific problems were identified by respondents in smaller or offshore communities.

The word clouds show that there was significant feedback about local warnings and evacuation messaging. Some respondents suggested that these should be issued earlier with stronger advice and recommendations for action. Similarly, responses indicated that doorknocking and sirens could be used to disseminate flood hazard warnings in relevant neighbourhoods rather than sending a generic text. There was high variability in respondent evacuation choices and actions during the flooding events and there was no clear insight into how different respondents understood and evaluated the risks being communicated (Bratas 2018; Rondeau and Deans 2023; Scovell et al. 2019). Apart from safety messages and hazard warnings, greater awareness and understanding are needed about the purposes and locations of refuges and evacuation centres. Given the extent of power loss associated with each event, it was recommended that there are public warnings given in advance about the potential for evacuations.

### Establishing trust and credibility

Although relatively satisfied overall, respondents felt that many emergency response agencies provided conflicting, contradictory and misleading information. Specific examples of misinformation were provided, however, the prominence of the Bureau of Meteorology, government websites and local council disaster dashboards as a source of information, suggests a recognition of these as authoritative sources. Respondent opinions were divided about the credibility of established amateur weather forecasters on social media, however, the value was seen in their capacity to convert scientific information into non-technical information and to directly respond to questions from community members. Local radio stations with established media personalities that transmitted from affected locations and who interviewed locals were regarded as more trustworthy than print or commercial TV and radio stations that broadcast from external locations. Respondents indicated that communities seek leadership from official sources and, based on survey comments, generally found this was lacking in each of the events. It is evident that respondents wanted specific information that would directly apply to their situation and circumstances but were faced with an abundance of information that often lacked consistency or accuracy. If an inaccuracy was perceived, respondents lost confidence in the quality and value of the content. A perceived lack of timely, relevant and factual information undermined community trust.

## Conclusion

The post-disaster survey data generated from 3 disaster-declared events demonstrate a diversity of hazard communication and information needs. Respondents consistently expressed a desire for more choice, more information, more often. This places a greater pressure on members of the community to sort, balance and act on information from many sources. Misinformation was common. Flaws were also evident in people's perception, understanding and interpretation of information and messages. The fault is not that of emergency managers, forecasters, the media and public servants or the recipients in communities. Rather, there is a continual need to educate, communicate and actively involve stakeholders before and during events. Consistent with the literature,

 

a key finding of this research was the need to maintain simple, clear, consistent, accurate and relevant messaging regardless of the source.

As individuals and households directly affected by these hazard events, the experiences of the respondents give an insight into their community's levels of resilience. People remain at the centre of all strategies to build resilience. People should also be the focus of messaging and information. Misunderstanding of information may be inevitable and the more information people receive, the more they are required to sort and interpret it. The passive provision of information has to be interpreted and explained to people through a process of education and engagement. Although the findings from this research are specific to the hazard events, it reinforces the challenges and complexity faced by the emergency management sector to prepare, test and provide effective emergency information and communication. Sharing practical lessons and community recommendations from experience will assist the development of future approaches and information products to better safeguard communities.

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# How perceived distance and lived experience influences water-related threat perceptions: a case study

Peer reviewed

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## Abstract

Across the globe, countries grapple with strains on resources and the effects of climate change on the ways populations live. Australia's fresh water supplies are vulnerable and the nation will continue to experience water security issues. Thus, understanding the perceptions of people to the water security threat will assist in developing effective mitigation strategies. To identify these perceptions, a case study of residents in the coastal city of Townsville in north Queensland, Australia, was undertaken. A total of 299 participants were recruited who completed an online survey that, in line with construal level theory, presented water scenarios as proximal and distal in terms of spatial, temporal, hypothetical and social distances. Results were that distal threats and previous exposure to water-security threats elicited higher individual threat perceptions. This research offers considerations for future water security mitigation strategies that encourage water-saving behaviour, particularly in this region.

## Introduction

Australia's fresh water supplies are vulnerable (Gleick 2012; Gregory and Hall 2011; Ray Biswas et al. 2023). This vulnerability is intensified by climate change, which has already had major implications for freshwater resources, water management and overall water quality (Beeson 2020; Gleick 2012; Pearce et al. 2013; Ray Biswas et al. 2023). Population growth and increased agricultural and industrial activities also add pressure to already strained water supplies (Gregory and Hall 2011; Sullivan 2020). As a result, there is a greater demand for water but a shrinking supply for the nation.

With climatic events having direct and indirect impacts on the way Australians live and as such events show no signs of reprieve (Bureau of Meteorology 2018; Steffen et al. 2018), there has been a substantial effort to increase water security, particularly freshwater supplies, within the country. These strategies include implementing supply limits, technological advancements in the home, access to water infrastructure, changes in water distribution structure and a significant focus on reducing demand for water (Beeson 2020; CSIRO 2011). Several methods are already in place to reduce residential water usage and water-saving campaigns are among the most common techniques to promote household water conservation (Koop et al. 2019). However, whether these methods effectively encourage desired behaviour and safeguard water supply, in addition to the other common practices (e.g. water restrictions and entitlements) is questionable. This concern is particularly critical for people who do not perceive that they have experienced water insecurity, despite Australia's frequent exposure to extreme weather events.

The conflict between an individual's exposure to and perception of an event is a problem for implementing mitigation strategies that rely on prior knowledge. To effectively engage someone in the appropriate mitigation behaviour, messages need to be relayed to an audience before the event occurs. It is also challenging to create communication that aims to change current behaviour in order to prevent future negative outcomes—people are less likely to behave under such circumstances (Lorenzoni and Pidgeon 2006). There is evidence that threat perceptions are likely facilitators of behaviour in the environmental context (e.g. Kim et al. 2013; O'Neill and Nicholson-Cole 2009; Pardon et al. 2019). Therefore, exploring people's lived experience and 'distance' via the mechanism of threat may provide valuable information to inform behaviour-change strategies.

Research by Dolnicar and Hurlimann (2009) explored the influence that experience has on pro-environmental behaviour. For example, individual perceptions of water appear dependent on experience and water supply context in a study. Participants of that study were located in Adelaide, South Australia, and Brisbane, Queensland. Both locations had ongoing water security issues and participants were the most open to drinking recycled water (Dolnicar and Hurlimann 2009). In contrast, participants in Darwin, Northern Territory, indicated they had never been subjected to water restrictions and that they did not like the idea of drinking recycled water or that it was 'disgusting' to drink water from alternative sources (Dolnicar and Hurlimann 2009).

A study by Milfont et al. (2014) examined the relationship between coastline proximity and belief in climate change and support for a carbon emission policy in New Zealand. The study suggested that participants who lived closer to coastal regions may be more likely to experience weather-related events, consider future events and pay more attention to warnings about weather (Milfont et al. 2014). Results found that proximity to the coast was positively associated with an increased belief in climate change and support for the regulation of carbon emissions. Thus, such individuals would be more likely to engage in associated action, for example, preparedness or mitigation behaviour. These findings are supported by research conducted by Spence, Poortinga, Butler et al. (2011) as well as Haney (2021). These authors found that participants who had direct experience of flooding were more concerned and less uncertain about climate change and felt more confident that their actions would mitigate such a threat. Similarly, Haney (2021) found that experience with a natural hazard led to a greater belief in climate change and preparation for events and this spilled over into higher performance on household pro-environmental behaviours (e.g. recycling). Exposure to previous events or water insecurity influenced the behaviour, intentions and beliefs of participants. However, such research possibly overlooks segments of the population that are exposed to water-security threats and who may not perceive them as water-security issues.

## Construal level theory

Convincing individuals to engage in preventative behaviour, particularly when that behaviour attempts to ease the effects of an environmental threat that may occur in the future, is a challenge. People tend to find environmental hazards difficult to grasp given these events can be, at times, invisible, occur gradually and are uncertain (Gifford 2011). Psychological distance is the extent to which an event, object or idea is present in an individual's direct experience (Liberman et al. 2007). For example, the predicted effects of climate change could be argued to be a psychologically distant event to an individual. The immediate effects are hard to detect, the scale is global and the eventual outcomes are uncertain. In other words, climate change is not present in an individual's direct experience. Exploring the effect of psychological distance on threat perceptions may assist in understanding how distance may influence an individual's threat perceptions about water security.

Construal level theory (CLT) (Liberman and Trope 1998; Trope and Liberman 2003; 2010) was used to examine how psychological distance facilitates the threat perception of people. CLT proposes 4 types of psychological distance that can alter an individual's perception: temporal, spatial, social and hypothetical. CLT describes the relationship between psychological distance and the extent to which an individual's thinking is abstract or concrete. The theory's hypothesis is that the more psychological distance increases, the more abstract one's thinking (Trope and Liberman 2010). Close events encourage a person to act due to the increased ability to focus on situational cues. This is because these events have little ambiguity and uncertainty and individuals can focus on the specific consequences of their actions (Liberman and Trope 2008). In contrast, distant events may be perceived as more uncertain. Evidence suggests that this distance or events being perceived as abstract helps people make decisions that align with their core values and beliefs (Liberman and Trope 2008). Table 1 shows how each component of psychological distance is conceptualised in the current research.

Limited evidence has used CLT and the concept of psychological distance in contexts with a high degree of uncertainty, for example, environmental events. In this context, particularly water security, situations may be perceived as uncontrollable and have uncertain consequences (Lorenzoni et al. 2007). Encouraging

 

Table 1: Operationalisation of construal level theory psychological distances.

| Distance | Operationalisation example |
|---|---|
| Temporal (time) | Future vs. Past<br>Near future vs. Far future |
| Spatial (physical space) | Near vs. Far<br>Here vs. Over there |
| Social (interpersonal distance) | Self vs. Other<br>Similar vs. Dissimilar<br>Familiar vs. Unfamiliar |
| Hypothetical (likelihood) | Real vs. Hypothetical<br>Likely vs. Unlikely |

individuals to view future environmental events as concerning (i.e. having an abstract mindsight) while currently acting to reduce or mitigate such events from occurring in the future (i.e. specific goals) would be the ideal relationship between perception and behaviour in this context.

Research has attempted to explore the effects of manipulating psychological distance on the performance or intention of people to perform pro-environmental behaviours. For example, the relationship between psychological distance and behaviour was investigated by Spence, Poortinga and Pidgeon (2011) who explored and characterised the CLT psychological distances (temporal, social, spatial and hypothetical) concerning climate change. Researchers argued that many people perceive climate change as psychologically distant on all CLT dimensions and this could be the reason for declining concern and increasing uncertainty and scepticism (Spence, Poortinga and Pidgeon 2011). These researchers also aimed to determine if reducing the psychological distance of climate change risk helps promote sustainability behaviour, given the unpredictable and uncertain nature of such events. Participants completed an interview-style survey that asked about cognitive constructs relating to energy and climate change, behavioural intentions, perceptions of climate change and psychological distance dimensions. Results indicated that lower psychological distance, specifically personal and local considerations of climate change, was related to greater concern about climate change. However, in terms of action, the broader global effects of climate change (i.e. greater psychological distance) were more likely to encourage intentions to behave sustainably. The implications of climate change on distant locations may have assisted individuals within the sample considering their preparedness behaviour in response to future threats. However, it did not influence their concern regarding the effects of climate change on their own environment. These findings support that of Kortenkamp and Moore (2006) who suggested that individuals had a greater willingness to cooperate when uncertainty was low, suggesting the effect a temporal influence has on one's desire to cooperate. This finding highlights the influence delayed effects have on decision-making: the more immediate the consequences are, the more likely one will reduce resource consumption (Kortenkamp and Moore 2006).

Taken together, these findings highlight an important consideration for using CLT psychological distances in the environmental context when predicting behaviour. It suggests that close psychological distance would enable more action to occur, given the certainty of environmental events and their consequences. It should be noted that these studies were based on the large and broad issue of climate change and general environmental events. It would be useful to examine whether the findings were consistent with environmental threats of a small, localised nature, which is the focus on this study. This is supported by research from van der Linden et al. (2015) who suggested that communications should be presented as local, proximal problems with personal risks to facilitate public engagement. This is supported by Scannell and Gifford (2013) who indicated that participants were more receptive to localised messages and information compared to distant or global information.

Specific to the water security context and examining the interplay between global issues and localised events, Deng et al. (2017) investigated the mechanisms that increase an individual's adaptive behaviour. Researchers applied CLT to the context of water security with participants who lived in a drought-prone area. Results found concrete perception of saving water (i.e. the event is perceived as proximal) plays a significant role in engaging in specific adaptive water-saving behaviours compared to an abstract perception of climate change (i.e. an event that is distal). While the study established an important connection between localised disasters and climate change, there were central points to consider for the current study. First, the sample comprised of high school students, thus limiting the generalisability of the study's findings. Additionally, the study by Deng et al. (2017) did not explicitly examine the individual components of CLT (i.e. the social, temporal, hypothetical and spatial psychological distances), thus arguably not investigating the true utility of the theory in the water-security context. While it is promising that CLT has been applied in the water-security context, these considerations are of key interest to the current study, which also applies CLT to a localised water-related event.

The psychological distance of an event could be argued to affect an individual's threat perception and, as a result, influence mitigation behaviour. In this instance, the proximity of an event or exposure to previous events are also likely behavioural facilitators. Furthermore, examining more localised events, rather than a generalised discussion

of environmental events, may provide evidence for using CLT in this context. Communities that have experienced significant water security events, such as Townsville, allow for such investigations between lived experience, threat perceptions and behaviour to occur.

## Case study area: Townsville

Townsville is a city on the north-east coast of Queensland, Australia and is in a climatically classified 'dry tropics' region with a population of 234,283 (Australian Bureau of Statistics 2021). The region's main water supply is the Ross River Dam, which was constructed in 1970 originally for flood mitigation and water storage (Townsville City Council 2020). The Townsville City Council supplies potable and non-potable water to properties within the Townsville local government area, with residents charged for their consumption based on a rate per kilolitre of usage.

Before the current study, the Townsville region had been subject to a water-security threat (drought) for almost 3 years, from November 2015 until May 2018. The area had not previously been drought declared since 2003. On 25 August 2015, the dam level fell below 40% and the Townsville community was first exposed to Level 1 water restrictions. At the height of the drought, the city experienced Level 3 water restrictions, which were enforced in August 2016. Failure to comply with these restrictions led to financial penalties for community members.

Townsville City Council Level 3 water restrictions:

- No sprinkler and irrigation systems.
- Handheld watering (only 6am–7am and 6pm–7pm) on an odds and evens watering system.
- Buckets, watering cans and drip irrigation systems can be used at any time.
- Switch off all automatic watering systems.
- Use of a broom to clean hard surfaces (not a hose).
- Use of a bucket of water-efficient car wash to clean vehicles and boats.

In February 2018, a rainfall event occurred in the Townsville region during the drought period. Within a number of days, the Ross River Dam exceeded capacity. In March 2018, Townsville's water restrictions eased to modified Level 2 restrictions, which allowed residents to use sprinklers for lawn watering between 5pm-8am, 3 days per week and handheld hose watering at any time.

Figure 1 shows the historic dam levels for the Ross River Dam from 2017 to 2019, being the levels from the drought to the flood period.

Townsville was selected as the research site for this case study due to the community having just experienced 2 major water-related events, both in terms of insufficient water (drought) and too much water (flood). This made the population of interest unique regarding water-related threats. Also, there is minimal empirical research regarding effective communication in the water-security context to increase water conservation behaviour in at-risk communities or towns that considers previous exposure, perception of threat and also the unpredictable nature of environmental risk. Therefore, this research explored the complicated nature of individual threat perceptions of water to provide recommendations for risk messages in the water-security context. Through the manipulation of water-related communications (one presenting a proximal event and the other a distal event), 2 hypotheses were examined:

1. There would be a difference in the threat perceptions of individuals after exposure to proximal and distal scenarios, with proximal scenarios predicted to elicit higher threat perceptions, in line with the previous research.
2. Those who perceived they had experienced a water security threat within the Townsville region would report higher threat perceptions after each scenario presentation compared to those who did not.

## Method

A pre-post experimental study design was conducted that examined threat perceptions of participants at baseline (pre-exposure to scenarios) and after exposure to 2 scenarios. Ethical approval was obtained through the James Cook University Human Research Ethics Committee (approval number H7675).

### Participants

The survey recruited participants from Australia. However, for this study, only participant responses from the Townsville region were kept for analysis. The final sample consisted of 299 participants (205 females, 93 males and one individual not indicating a gender). Participants were from Townsville, ranging in age from 17 to 65 years (M=25.12, SD=10.61). Most participants (n=241) indicated they did not own a home and that they had experienced a water security issue (for example, their town had been drought declared) (n=233).

### Materials

All participants completed an online questionnaire containing 41 questions, which took approximately 20 minutes to complete. In addition to the questionnaire, participants were presented with 2 vignettes describing a water-related scenario. Scenario 1 described a situation

 

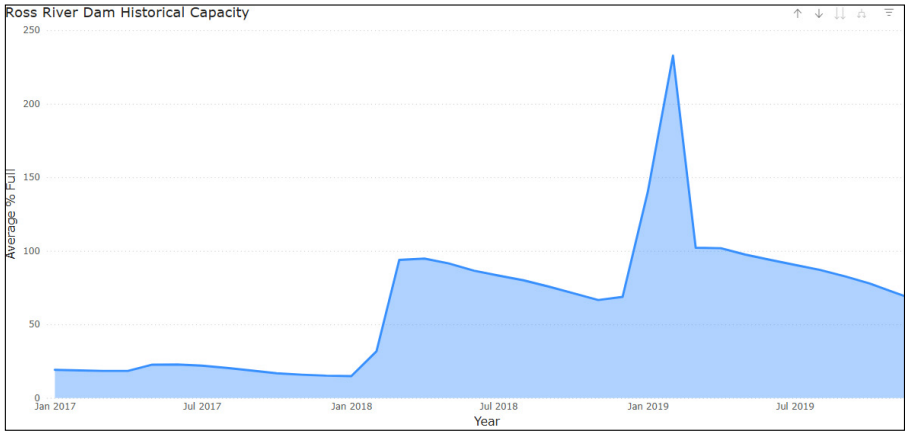


Figure 1: Ross River Dam levels (percentage) from 2017–19.

Source: Townsville City Council website www.townsville.qld.gov.au/water-waste-and-environment/water-supply-and-dams/dam-levels.

Note: Current study data collection occurred between April 2019 and September 2019.

where participants were instructed to imagine the scenario applied to their town or city (which they were required to name earlier in the questionnaire). As all non-Townsville respondents were removed from the analysis for the purpose of this study, the city or town presented in the proximal scenario was always Townsville. This was to mimic a 'close' event in terms of hypothetical, temporal, social and spatial distance and as guided by the CLT (Trope and Liberman 2010). For Scenario 2, the description was much broader. It was about Australia in general, to mimic a 'far' event in terms of hypothetical, temporal, social and spatial distance. Table 2 summarises each scenario description.

## Measures

The questionnaire used was part of a larger study and only variables pertaining to the current work are presented:

- demographic information - including gender, age and home ownership
- previous water-security experience - was assessed by one measure: 'Have you ever experienced water security issues (e.g. has a town you have lived in/are currently living in, been drought declared, was the local dam at a low capacity, etc.)?', with forced choice options: Yes or No.

### Threat severity and susceptibility

Threat severity was defined as the perception of how much harm the event/stimulus can cause to the individual (Witte 1992). Threat susceptibility is defined as perception of how close the event is in terms of proximity to the individual (Witte 1992).

These measures were adapted from the Risk Behaviour Diagnosis Scale (Witte et al. 1996). Participants were asked to indicate how much they thought the negative effects of water security described in the scenarios would negatively impact and were likely to affect themselves, their friends and family, people in their current city/town, their

Table 2: Scenario descriptions.

| CLT factor | Proximal scenario | Distal scenario |
|---|---|---|
| Spatial | Townsville is experiencing a major water security issue. | Currently Australia is experiencing a major water security issue. |
| Social | Townsville is the only community experiencing water insecurity to this degree in Australia. | Australia is not the only country experiencing water insecurity in the world. |
| Temporal | Townsville has not experienced substantial rain in over 4 years. | Australia, overall, has not experienced substantial rain in over 12 months. |
| Hypothetical | It is predicted that Townsville will remain on water restrictions for a substantial period. | It is predicted that Australia will experience many negative effects as a result of this water security issue (for example, mass soil erosion). |

Note: For the temporal distance statement, the timeframes chosen (4 years and 12 months) were relative to the area (i.e. Townsville and Australia). It would be unlikely that the whole of Australia would not experience rain for over 4 years. This timeframe (4 years) would be more likely for a small geographical area like Townsville. Additionally, Townsville had recently experienced a drought that spanned over 4 years (from 2015 until 2019) before the data collection for this study, again emphasising the likelihood of this occurring in the region.

current city/town (economically/environmentally), people nationally within Australia and Australia (economically/environmentally). The 6 items for each measure were rated on a 7-point Likert Scale (1=no negative effect/not likely at all to 7=extreme negative effect/extremely likely) and higher scores indicated higher threat severity and susceptibility perceptions, respectively. Question scores were averaged to give each individual one threat severity and one threat susceptibility score between 1 and 7, as per the original response scales. For both scenarios, the same set of 6 questions for each measure was repeated, giving each participant a pre-exposure threat severity and threat susceptibility score and 2 post-scenario threat severity and threat susceptibility scores. All threat severity and susceptibility measures had a Cronbach alpha value of .80 or above.

## Procedure

Recruitment sites included online social media networks (Twitter and Facebook) and university and community networks via local radio stations. Participants were provided with a URL for the survey. Participants completed the survey via the Qualtrics online platform. All statistical analysis were performed in the SPSS version 27 computer program.

The study followed an experimental design. First, all participants completed demographic and previous experience questions as well as threat severity and susceptibility measures. Participants were then randomly allocated to read one of 2 scenarios (proximal or distal scenario) with participants viewing both by the end of the experiment. The scenario presentation was counterbalanced to avoid confounding variables. For both scenarios, participants were asked to imagine they were experiencing the situation described. After each scenario viewing, participants were again asked to complete threat severity and susceptibility measures.

## Results

Table 3 shows the mean (SD) scores for all threat measures. Repeated-measure ANOVAs were conducted between the 3 condition scores on all threat variables to assess if scenario presentation altered threat and efficacy perceptions. First, the relevant assumptions were assessed. The dependent variables were measured on a continuous level and the independent variable had 2 or more groups (3) and no significant outliers. Additionally, the distribution of the dependent variables was normal. For the threat variables, the sphericity assumption was violated given the Mauchly's test p-values were less than .05 for threat susceptibility ($\chi2_{(2)}$=.97, p=.007) and threat severity ($\chi2_{(2)}$=.96, p=.004) between all 3 scores (pre-exposure, proximal scenario and distal scenario). Because of this finding, the Greenhouse-Geisser correction was applied. The Greenhouse-Geisser value was greater than .75 for threat susceptibility (.97) and threat severity (.97). As a result, the Huynh-Feldt correction was used.

Results indicated a significant main effect of scenario exposure on threat susceptibility perceptions ($F_{(1.95, 542.95)}$=38.78, p<.01). Additionally, there was a significant main effect of scenario exposure on threat severity perceptions ($F_{(1.94, 541.12)}$=59.67, p<.01). Post-hoc analyses were conducted using a Bonferroni adjustment. There was a significant difference between means for the pre-exposure and distal scenarios and the proximal and distal scenarios (all ps<.01) for threat susceptibility and severity. The distal scenario presentation resulted in the highest threat perceptions. No significant differences were found between the pre-exposure and proximal scenario for either variable (ps>.05).

Next, a 2-way repeated-measures ANOVA was conducted to measure differences in threat perceptions after proximal and distal scenario exposure for respondents who perceived they had experienced a threat to their water security and those who had not. First, threat severity was analysed and results showed there was a significant main effect of scenario exposure on participant threat severity scores ($F_{(1,278)}$=56.84, p<.01) with the distal scenario exposure increasing threat severity perceptions for both groups. There was a non-significant main effect of perceived experience on individual threat severity scores ($F_{(1,278)}$=3.76, p=.054). There was also no significant interaction between scenario and perceived experience ($F_{(1,278)}$=1.25, p=.27).

The same analysis was conducted for threat susceptibility. The analysis showed there was a significant main effect of scenario exposure for participant threat susceptibility scores ($F_{(1,278)}$=27.16, p<.01), with the distal scenario exposure increasing threat susceptibility perceptions for both groups. There was also a significant main effect of experience on individual threat susceptibility scores ($F_{(1,278)}$=7.42, p=.01) with lower threat susceptibility scores shown for respondents who did not perceive they had experienced a threat to their water security. There was no significant interaction between scenario and perceived experience ($F_{(1,278)}$=1.96, p=.16). Table 4 shows the mean and standard deviations for relevant variables for this analysis.

Table 3: Mean (SD) of EPPM variables for each condition.

| Variable | Pre-exposure | Post-exposure Proximal | Post-exposure Distal |
|---|---|---|---|
| Threat susceptibility | 4.44 (1.21) | 4.47 (1.21) | 5.04 (1.17) |
| Threat severity | 4.26 (1.28) | 4.15 (1.31) | 4.96 (1.22) |

 

## Discussion

Understanding the influence of psychological distance on individual perception could assist in the construction of effective risk-communications. This study attempted to understand how framing a threat as proximal or distal could affect an individual's threat perceptions in the water security context and how this may be influenced by perceived previous experience of such events.

In line with previous research, it was predicted that there would be a difference in threat perceptions after exposure to proximal and distal scenarios with proximal scenarios predicted to elicit higher threat perceptions (Deng et al. 2017; Scannell and Gifford 2013; Spence, Poortinga, Butler et al. 2011). The case study sample showed statistically significant differences in perceived threat severity and susceptibility at pre-exposure compared to perceptions after exposure to the distal scenario and between proximal and distal scenarios. Exposure to the distal scenario resulted in higher threat susceptibility and severity perceptions in comparison to pre-exposure and proximal scenario responses. Additionally, it was found that there was no difference in threat perceptions between pre-exposure and post proximal scenario responses. Therefore, the hypothesis was partially supported in relation to distal but not proximal scenario responses.

Previous research suggests that threat perceptions may be influenced by psychological distance in that a proximal event would result in greater individual concerns and receptivity than one that was distal (Deng et al. 2017; Scannell and Gifford 2013; Spence, Poortinga and Pidgeon 2011). The current study results somewhat conflict with the research conducted by Scannell and Gifford (2013), who indicated that participants were more receptive to personally relevant messages or information about a local event than distant or global information. Additionally, and specific to the water-security context, the results also conflict with the research conducted by Deng et al. (2017), whereby proximal events were more predictive of behaviour in participants experiencing drought.

Table 4: Mean for threat variables for each scenario for each experience group.

| Threat variable | Scenario | Perceived experience (n=233) | No perceived experience (n=66) M (SD) |
|---|---|---|---|
| Threat susceptibility | Baseline | 4.61 (1.16) | 3.86 (1.25) |
| | Proximal | 4.52 (1.17) | 4.28 (1.31) |
| | Distal | 5.16 (1.14) | 4.65 (1.19) |
| Threat severity | Baseline | 4.34 (1.27) | 3.84 (1.41) |
| | Proximal | 4.20 (1.29) | 4.01 (1.37) |
| | Distal | 5.05 (1.25) | 4.65 (1.09) |

According to CLT, a psychologically distant event may inhibit mitigation behaviour and does not elicit threat perceptions as much as proximal environmental events (Liberman et al. 2007). However, participants in the current study reported higher threat perceptions after exposure to the distal scenario, which was framed around an event that may occur and was further away in terms of psychological distance. The differing results between previous research and the current study can perhaps be explained by the contextual experiences of the current study sample. These contextual experiences should be considered in all results, given the disastrous effects they had on the community and the timing of data collection.

The distal scenario may have been more threatening to the current sample given the wide-ranging effects described within this scenario, including mass soil erosion, decreased pond/dam levels and a shortage in stock production. This result may be due to this information being new to respondents who were accustomed to the current water restrictions. Townsville is geographically surrounded by rural communities that are reliant on livestock and vegetable farming industries for economic support. As such, participants of this study may have been familiar with the larger scale negative effects that may occur due to water security issues, such as widespread agricultural loss (CSIRO 2011). These other consequences may have been more threatening than more local impacts, such as continued water restrictions.

Greater distance resulting in higher threat perceptions aligns with the research conducted by Spence and Pidgeon (2010), where the framing of climate change impacts as distant resulted in these impacts being perceived as more severe. Researchers concluded that this result emphasises that climate change is a naturally psychologically distant phenomenon (Spence and Pidgeon 2010). Perhaps it may be that water insecurity is considered a naturally distant phenomenon, like climate change, even for those currently experiencing its adverse effects. Therefore, the events and consequences described in the distal scenario are more far-reaching, affect more people and contribute to the increase in the Townsville sample threat perceptions.

Previous experience may have also led to the non-significant difference between pre-exposure and after exposure to the proximal scenario. Despite flood occurring and the Ross River Dam being over-capacity, water restrictions were still in place. As a result of the recent drought in the region, the perceived threat of a drought within the sample may have already been high at baseline. The reality (pre-exposure) for participants of this study was similar to some of the information presented in the proximal scenario vignette. For example, the proximal scenario referred to water restrictions being in place. Thus, threat perceptions did not change from baseline

to post-proximal scenario exposure. As suggested in the health research by Roberto et al. (2019), repeated exposure is argued to desensitise viewers to the threat. Therefore, it is not surprising that reading the proximal scenario produced little change in threat susceptibility and severity for the sample. In addition, the majority of participants did not own their home, which may influence their exposure to local council water rates that fund accessing and maintaining potable water, contributing to overall perceptions of price for water and potentially threat perceptions of water scarcity. In terms of future communication, describing a previously lived experience that a community has coped with may assist with preparing for such events without unnecessarily raising threat perceptions or concern in a community.

When considering previous experience specifically, however, this may have further implications for communication. Having experienced a threat previously would make an individual perceive they are more susceptible to future events, as it has happened before and is almost certain to occur again within the region (Spence, Poortinga and Pidgeon 2011; Zaalberg et al. 2009), as predicted in hypothesis 2 for the current study. Those who may not have experienced such events may need convincing about the personal relevance of the event to encourage behaviour change, specifically using information targeting threat susceptibility. This argument is based on previous research stating that proximity to the coastline and more frequent exposure to climate-related events (specifically flooding) led to increased climate change beliefs, greater concern for climate change and increased engagement in pro-environmental behaviour (Milfont et al. 2014; Spence, Poortinga, Butler et al. 2011). This is comparable to the research by Zaalberg et al. (2009) who found that residents living in flood-prone areas in the Netherlands were more worried about future flooding and perceived the consequences of future flooding as more severe, perceived themselves as more vulnerable to future flooding and had stronger intentions to take adaptive actions than those who had not been exposed to flooding. In the local context, a community survey revealed that the majority of respondents who had experienced previous floods in both Queensland and New South Wales were more engaged and knowledgeable about flooding in their region (Taylor et al. 2023a). Therefore, the current study provides evidence that the effect of previous experience on threat perceptions may apply to other areas where water-related issues, like drought, commonly occur. For the current population, given exposure to such events both in terms of recency and frequency, it would be expected that previous experience would be an indicator of water conservation behaviour.

In the current study, 22% of the sample did not perceive they had experienced a threat to their water security, despite likely having previously experienced a major drought and flood, given the timing of the data collection. Although perhaps a true reflection of inexperience, it is worth considering that this result may highlight the lack of understanding about what is viewed as a threat to water security, particularly given people's ability to cope with such events. Given individuals living in the region are familiar with these events, this sample may not perceive these issues as long-term water security threats but rather as 'natural disasters' as they are commonly presented or described in the media (Hart and Feldman 2014), which are likely to be accompanied by scare tactics to encourage behaviour. This is consistent with findings by Taylor et al. (2023b) who, through discussions on preparedness behaviours with risk-prone communities, evidenced how people in Australian often view flooding as episodic rather than persistent threats to water security. Furthermore, the case study group experienced a significant drought and was limited to specific water-related behaviour; however, they could still access and use the resource. This may have lessened threat perceptions of the drought and similar events threatening water security over time for this sample.

There is some consideration for the relationship between past environmental threat experiences negatively influencing future responses. For example, research by Demuth et al. (2016) found that past hurricane experience, in terms of previous evacuation or financial loss, increased evacuation intentions. This has been found in previous literature where experience led to increased behaviour (Haney 2021; Spence, Poortinga, Butler et al. 2011; Zaalberg et al. 2009). However, the opposite has also been found, with those who experienced past hurricane-related emotional effects (emotional distress) exhibiting lower self-efficacy, which decreased evacuation intentions (Demuth et al. 2016). Additionally, and more pertinent to the water-security context, Deng et al. (2017), in contrast to other known literature (e.g. Liu et al. 2022) found that previous drought experiences had no relationship with water-saving behaviour. This research may suggest that the concept of perceived experience requires an in-depth examination to understand whether event context, event type, water security knowledge or coping strategies, pricing of water and home ownership may have influenced participant responses in the current study, and more specifically, in a region that frequently experiences water-related hazards. Regardless of these mixed findings, this highlights problems with creating communication that may attempt to raise threat perceptions about water security to encourage mitigation behaviour in samples such as those from Townsville, where water-related hazards have frequently occurred.

 

## Limitations

Although the Townsville region is a novel location to study, the sample is not representative of the Australian population. Results cannot be generalised across Australia but may be generalised to communities that have experienced threats to water security. This study did not account for household water pricing as a factor influencing perceptions of scarcity, which may have affected how participants viewed the urgency of water conservation. This factor differs greatly across Australia and could be the subject of other work.

## Conclusion

This research took an approach grounded in psychological theory and provided considerations for future construction of water security communications, specifically in a community that had recently experienced major water security issues. Results presented several challenges to those communicating potential threat information, particularly given proximal water security threats are perceived as less threatening than distal water security threats and threat perceptions being known drivers of behaviour.

Exploring the effect of proximity on individual threat perceptions may provide a better understanding of individual behaviour in response to environmental issues. With threat perceptions being significantly different between regions, it is reasonable to assume that communication strategies should take this into consideration. This research highlighted the complexities of threat perceptions in the water security context, particularly for individuals who have experienced major issues in the past.

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## Abstract

In 2022, the Northern Rivers of New South Wales experienced a significant flood event. River levels and resulting damage were the worst recorded equating to billions of dollars in damages. Local agencies in the area played a critical role in the response and recovery but were commonly excluded from formal processes. A study of the experience and role of local place-based agencies examined their place in emergency and disaster management through focus groups with agency representatives. This research aimed to understand the experiences of these place-based agencies and their contribution to disaster management within the community. Findings highlight the negative effects experienced by these organisations of their exclusion from emergency planning processes both pre- and post-disaster. This paper argues for acknowledgment of the important contributions place-based agencies make to disaster-affected communities as well as the need for their inclusion in formal processes across all phases of emergency management. Using the experience of the Northern Rivers floods, the inclusion of place-based agencies 'at the table' will enhance planning and management capacity and build community resilience.


# Bringing place-based agencies 'to the table' in emergency management


Peer reviewed



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## Introduction

In 2022, the Northern Rivers of New South Wales (NSW), Australia, experienced an exceptional flood event. The resulting damages were reported to be the worst recorded, equating to $9.6 billion in damages (Read 2023). In many affected communities, place-based agencies were central to response and recovery efforts and continue to provide recovery and resilience-building supports. At times, these local agencies were the only readily available support in the initial post-flood period. This paper describes a 3-phase study of the role of place-based agencies in emergency and disaster management, drawing on the findings from focus groups that explored the experience of local place-based agencies in the Northern Rivers following the 2022 floods. Phase one of the study was a literature review and phase 2 was a policy analysis.

The United Nations Office for Disaster Risk Reduction (UNDRR) defines 'disaster' as 'a serious disruption of the functioning of a community leading to one or more of the following: human, material, economic and environmental losses and impacts' (UNDRR n.d.). According to Barton et al. (2020), 'disaster management' involves 4 phases of preparedness, emergency response, recovery and building community resilience. In Australia, the *Community Engagement for Disaster Resilience* (Australian Institute for Disaster Resilience 2020) defines these 4 phases as prevent, prepare, respond and recover.

Within emergency management, the importance of resilient communities and the benefits attributed to being disaster-prepared are increasingly being recognised (Golding et al. 2020). Golding et al. (2020) argued the benefits attributed to communities being disaster-prepared are seen as contributing to healing from the grief created from disaster events. In some countries where disaster events are more prevalent

(Okada et al. 2018; Rapeli et al. 2018), the community is respected as a major stakeholder and is actively involved in emergency management processes while in others, including Australia, community participation is not as obvious.

Place-based agencies, central to many communities, are established to support and advocate for members of a community, particularly those whose vulnerability put them at greater exposure or risk or results in disadvantage or marginalisation. The concept of 'place-based' recognises issues and needs based on location, including disadvantage. It acknowledges and focuses on the contexts and circumstances of 'people in place' with place-based agencies focused on understanding and responding to the needs of the local population to address local issues (Klepac et al. 2023, p.2; Proudley 2013). These agencies may commence as a volunteer service and because of their capacity to understand and respond to the needs of the local demographic, may be considered worthy of government funding. These agencies commonly rely on community donations and philanthropic funding to respond to community needs. Often, place-based agencies are staffed by a mixture of local and experienced community support managers alongside people with local expertise who are well-placed to effectively and efficiently respond to community needs. The availability of skilled staff and volunteers significantly improves an organisation's capacity to be responsive to community crises.

While government agencies and large-scale state-based or multi-site organisations are often responsible for emergency and disaster management processes, there is a need to recognise and engage with place-based agencies. Given the existing staff, volunteers, relationships and resources these agencies have in the community, they have a greater likelihood of being able to engage immediately with community members on a personal level and provide agile responses to changing needs (Golding et al. 2020). Further, place-based agencies are knowledge holders when it comes to providing local support and they offer greater community inclusion in emergency and disaster management (Golding et al. 2020). As such, place-based agencies can articulate first-hand the grief, loss and trauma being experienced throughout the community and actively contribute to responses. In contrast, large organisations may struggle to comprehend the intricacies of each community. Their approaches can sometimes lead to a one-size-fits-all model, which may not effectively address the nuanced needs of diverse local populations. For this research, we have excluded these larger entities from the study because we wanted a localised approach to community development.

Place-based agencies have existing relationships with local communities and possess valuable local geographical and historical knowledge. They are aware of the strengths, weaknesses and needs of their community and have knowledge of the resources in the area and where they are placed. The importance of including local place-based agencies in every phase of emergency management in Australia is promoted in the *Community Engagement for Disaster Resilience* (Australian Institute for Disaster Resilience 2020) and is reflected in state and territory emergency management guidelines. As indicated in the 2022 NSW Flood Inquiry (NSW Government 2023), there is disparity between what was recommended in the guidelines and what transpired during the 2022 floods. This indicates that a better understanding is required about the role of place-based agencies throughout emergency management process, including in planning and evaluation phases.

Communities in the Northern Rivers regions of NSW have been subject to many floods. This paper discusses findings of phase 3 of a study of the role of place-based agencies in disaster management by Donnarumma et al. (2023) that examined the experiences of place-based community agencies processes during the 2022 events. This phase of the study involved focus groups with representatives of place-based agencies in communities affected by the floods. This study's findings reflect the experiences across these events and identified the significance of place-based agencies during these testing times. During the floods, many areas were cut off for days, even weeks, and place-based agencies and community members rallied to provide responses and community support with limited staff and resources in the absence of other response services (NSW Government 2023).

## Literature review

Resilience is beneficial in disaster-affected communities as it reduces the gap between social isolation and disparities in the advantages of some community members. A focus on bolstering community resilience can increase community wealth and addresses gaps in services that focus on community members who are more vulnerable or at risk through social disadvantage (Ali et al. 2021; Howard et al. 2018; Matthews et al. 2020). Golding et al. (2020) detailed experiences of some rural communities affected by disasters, telling of the significance of coming together and rebuilding for the greater good of the community. Further, Golding et al. (2020) explained how many rural communities in Australia face sudden and unplanned change with experiences of bushfires and floods over recent years. They argued that greater community engagement can increase community resilience following disaster events (Golding et al. 2020). The NSW Flood Inquiry (NSW Government 2023) identified gaps in community engagement and resilience-building in the government-led approaches to emergency management as applied in the Northern Rivers, both before and after the

2022 floods. This had significant consequences for affected communities. Place-based agencies may contribute to addressing these gaps.

Place-based agencies often contribute to emergency management either formally or informally with the importance of the role of community organisation such as place-based agencies in emergency and disaster management increasingly recognised internationally (UNDRR 2015). Gray et al. (2021) stated that place-based agencies have historically built strong relationships with the community and have developed a deep knowledge of the territory, competence in providing specialised support to at-risk community members and are fundamental in helping with psychosocial recovery. Similarly, Muir (2021) and Rapeli et al. (2018) found that, in the aftermath of a disaster, place-based agencies can play a vital role in safeguarding lives by providing emergency rescue teams with precise information about the location of vulnerable people in their community. Research by Barton et al. (2020), Curnin and O'Hara (2019) and Scott and Coleman (2016) on effective strategies in emergency and disaster management show the importance of inter-agency collaboration and coordination between government and place-based agencies, stakeholders and academics.

The value of place-based agencies includes their representation of the diversity of community perspectives, including common issues and disparities, and their role as community advocates (Hyunjung et al. 2022, Okada et al. 2018; Rapeli et al. 2018). It is usual that place-based agencies actively support members of the community likely to be more affected by displacement, disadvantage and marginalisation (Howard et al. 2018). As such, place-based agencies fill a fundamental gap as they are the first point of contact in the community and often have networks that assist in reaching and supporting marginalised individuals and sectors (Howard et al. 2018; Matthews et al. 2020). In the context of emergency management, studies show that the inclusion of a wide range of different place-based agencies in local emergency management committees results in greater mitigation efforts. Place-based agencies are operated by community members who are commonly deeply invested in their communities with local connections and roots that place them as primary knowledge holders. As such, they are often the first to respond during an emergency providing both practice and social support. Further, they are there long after government support leaves (Hyunjung et al. 2022; Muir 2021; Scott et al. 2018).

Local Aboriginal and Torres Strait Islander community-controlled organisations and groups also provide place-based services. There is an inclination to ignore the historical knowledge of the lands and seas held by Aboriginal and Torres Strait Islander peoples within the community and opportunities to learn traditional remedial solutions are often overlooked (Matthews et al. 2020; Sithole et al. 2019). Failure to include Elders and Indigenous leaders from hazard-prone areas in solutions and emergency management planning can reduce the resilience of communities (Drennan and Morrissey 2019). Importantly, this knowledge offers opportunities for a deeper understanding of natural occurrences and the relationships between people and land. Literature strongly argues for participation of Aboriginal and Torres Strait Islander peoples in government-administered emergency management processes and that increased involvement in the development and implementation of policies is necessary (Ali et al. 2021; Sithole et al. 2019; Thomassin et al. 2019). The Firesticks Initiative in northern NSW and the Caring for Country initiatives (Matthews et al. 2020; Thomassin et al. 2019) are examples of successful collaboration between local Indigenous groups, government agencies and local agencies. This reiterates the importance of building relationships among different groups to increase resilience.

Co-creation between government and communities including place-based organisations can contribute to building trust, mutual respect and communication providing greater community knowledge and access to support in the event of a disaster (Hedelin et al. 2017; Muir 2021). Donnarumma et al. (2023) stated that, in Australia, there are several examples of successful collaboration and co-creation processes between government and place-based agencies. In Victoria, the inclusion of representatives of place-based agencies in Municipal Emergency Management Plan Committees (MEMPCs) is mandatory. All organisations share equal responsibility in the co-creating process. Additionally, Victoria has implemented EM-LEARN, a lessons-management framework where MEMPCs share practical advice learnt on the ground that other MEMPCs might implement. Another example that supports collaboration between government agencies and place-based agencies comes from South Australia and the Northern Territory where online portals have been created to enhance multi-agency coordination processes and share information among the organisations involved in response and recovery. A practice implemented in Western Australia consists of including Indigenous community members in the local emergency committees, while in Queensland local disaster coordination centres host representatives of different organisations under the same roof, enabling communication and collaboration. While some states and territories also conduct simulation exercises of emergency plans to strengthen preparedness, clarify roles and responsibilities and identify possible gaps in the response, limitations regarding the nature of the scenarios used and effectiveness of these exercises have been noted by McLennan et al. (2024).

 

Recognising the potential to enhance emergency and disaster management through engagement with place-based agencies, this paper discusses the study by Donnarumma et al. (2023) undertaken by Southern Cross University in consultation with NSW Council of Social Service (NCOSS). This study explored the experiences and perspectives of place-based community services about the support they provided to communities during recent extreme weather events, particularly the 2022 northern NSW floods. Insights regarding future opportunities and challenges are discussed.

## Methods

This study aimed to explore community sector involvement in and experiences of emergency and disaster management from the perspective of place-based organisation representatives. The study was in 3 phases: a narrative literature review, a cross-jurisdictional analysis including Australia and selected other countries and a qualitative study of the experiences and perspectives of community agency representatives. This paper reports on the findings from the third phase and focuses on the perspectives of place-based agencies and their engagement in the emergency management process.

Phase 3 of this study involved 8 focus groups, 5 were face-to-face and held in 4 communities within the identified affected areas. Three were online meetings for people unable to attend face-to-face focus groups. Agencies local to the flood-affected areas were invited to participate. Invited agencies were drawn from an initial list of 12 local agencies provided by NCOSS in consultation with the Northern Rivers Flood Working Group (NRFWG). Publicly available community directories were used to identify other place-based community service agencies to capture as many suitable agencies as possible in the region.

Identified local agencies were invited to send a representative to one of the focus groups. Nineteen, organisations responded to the invitation that resulted in 23 participants attending a focus group. The majority were from small organisations providing services only in the area in which they were based and 4 of the participating organisations delivered services in more than one location in the region. Most representatives attended a focus group in their local area. Three attended a group in a neighbouring community and the remainder attended online. Focus groups were recorded and electronically transcribed. All transcripts were manually reviewed and quality checked.

An inductive thematic analysis was undertaken (Clarke and Braun 2017). Early themes were identified during the transcript reviews. Transcripts were manually coded by 2 researchers. Early themes were expanded by the first coder and checked and developed in the second coding round. Themes were checked by a third researcher during the coding process for consistency of coding and themes. The coding resulted in a set of primary themes with related sub-themes. Significant primary themes focused on the response of government at all levels and the role of place-based agencies.

### Limitations of the method

While attempts were made to include a wide range of place-based agencies, this process may not have identified all relevant organisations. In particular, local groups may not have been recognised as service providers and therefore not included or may not have had capacity to participate. As qualitative methods were used, there are limitations to generalisability of findings. Further, as indicated in the literature, research regarding the role of place-based agencies in emergency management is limited. Thus, as the research focuses on the experiences and perspectives of place-based agencies that have directly contributed to emergency management in their local community, perspectives of other agencies and individuals involved in emergency management that may differ from those of the study participants are not considered or reflected through this study.

### Ethics statement

Ethics approval was received from Southern Cross University, approval number 2022/134.

## Findings

These findings discuss the data collected from the 8 focus groups. The participants reflected on experiences of multiple hazard events including floods, fires and drought, with a focus on the most recent floods in 2022. The data were analysed to identify themes. Quotes from the focus groups that best represent common statements were chosen and are provided as examples of the themes in this paper. Focus group participants and organisations have not been named to maintain anonymity.

### Place-based agencies as first responders

Focus group feedback confirmed that place-based agencies across different areas in the Northern Rivers were the first to respond to the 2022 floods. These agencies mobilised people and resources, coordinated volunteers and gathered and distributed a wide range of goods to flood-affected people.

> *We're just doing whatever we can to support the people... huge crisis as far as domestic and family violence, child sexual assault, homelessness... so that's our world.* (Study participant)

Additionally, participants mentioned how they ended up advising staff from NSW and Australian government agencies on what to do as participants indicated some

government agencies appeared disorganised and confused and lacked an understanding of the local context and needs. This demonstrates how crucial local knowledge is during the response phase. Participants described how their knowledge of the territory and community and their ability to fill the gaps seemed to be ignored. They also indicated that their efforts seemed devalued as shown by an apparent lack of government support and acknowledgment. However, in other instances, large-scale state-based or multi-site organisations not normally operating in the community relied on place-based agencies to provide the priorities and advise about where to go to assist locals. Participants felt this collaboration was often a delayed response.

> *ADF [Australian Defence Force] was reporting to me every morning. I was dispatching jobs… I was also feeding back to council… we provided… drinking water and showers for 6 weeks.*
> (Study participant)

The aspect of place-based agencies being historically overlooked in emergency and disaster planning, inter-agency meetings and post-disaster evaluations were considered and participants drew this out.

> *We had skills and expertise and local knowledge…we stood ready… but we weren't invited around any tables at all.*
> (Study participant)

Even if inter-agency coordination differed in inclusivity and uniformity across the Northern Rivers, the exclusion of place-based agencies from meetings with government and other stakeholders was a pressing issue in most focus groups. Participants lamented the apparent lack of effective disaster planning, community engagement and coordination as well as the consequent confusion, disruption and slowness of responses by various government agencies during and following the 2022 floods. This reflects findings of the 2022 Flood Inquiry (NSW Government 2023) that identified issues in relation to preparation, use of available resources, training, coordination and nature and timeliness of response and recovery. Participants also highlighted the key roles they play in building community resilience and the importance of participating in preparedness meetings that include government and non-government organisations together with local stakeholders and community groups. This commitment was evident although participants commonly indicating that their agencies were not supported to undertake this role through funding arrangements.

> *We're not even at the table. And they make decisions for us, not with us… We work with all our community.*
> (Study participant)

Participants stated that place-based agencies had an important role in the aftermath of the 2022 floods. However, most agencies were not included in any disaster management co-planning or inter-agency meetings. Participant perspectives indicated there was a lack of recognition or acknowledgement of the role and contributions of these agencies by those leading local emergency management processes. The failure to involve these organisations in the pre-planning phase limited local capacity to act fast and effectively. Most of these organisations were on the frontline during the response and were trusted by the community and were sought out as a source of support during recovery. Therefore, their exclusion from meetings hampered their ability to contribute to resources and information during the response efforts.

> *We had not been involved in any planning… with the council or any government agency… We had skills and expertise… they [the government] lent pretty heavily on us.*
> (Study participant)

This lack of communication contributed to some confusion and could have exacerbated difficulties in sourcing valuable information and in providing coordinated and consistent information to the public. Participants felt some residents, already affected and/or traumatised by the disaster event were left in limbo and exposed to conflicting information. Participants also felt a 'dysfunctional' relationship with some government agencies was a contributing cause of fragmentation and divisions within communities. A main concern was that when local organisations are excluded from decision-making processes, the whole community was affected and that social, psychological and physical disadvantages were not addressed.

> *There's lots of vulnerable people. As you know, they're just here in my town, like, a couple of streets away, going: "I need help. Where is it?" So much capacity got shut down by our council and government… it's just criminal.*
> (Study participant)

### The role of Aboriginal and Torres Strait Islander groups

Participants expressed the need for local Indigenous groups to be included in emergency and disaster management. This was related to their vast knowledge, their cultural care for Country and their capacity to provide a culturally safe and responsive approach for their communities. The failure to involve these groups was regarded as having led to a series of government interventions described as 'dictatorial' and lacking a trauma-informed approach. Some communities were cut off for weeks. The feedback from the focus groups indicated the inclusion of Aboriginal and Torres Strait Islander place-based agencies would improve the response to disasters and enhance the effectiveness of emergency management through a culturally responsive approach that respects and engages the local Indigenous community and their knowledge.

 

*Self-determining behaviour for rural and remote communities [was] lacking for Aboriginal communities... cut off for weeks … no access to food and worries for our Elders.*
(Study participant)

During the focus groups, examples were provided of situations where input was not sought from local Indigenous organisations or other place-based agencies related to cultural and community knowledge. This was regardless of the significant support provided to respond to local need. Participants provided insight into how local community members implemented local initiatives that government resources were unable to provide or where these were not available in a timely way.

*Police, SES [State Emergency Service] would arrive when the community was already undertaking the rescue.*
(Study participant)

*They couldn't help us because they couldn't get anywhere near us.*
(Study participant)

*Everything we're doing, we did off our own backs by way of preparedness… response … recovery and by way of managing trauma.*
(Study participant)

## Contributions of local knowledge and communication

There is a depth of knowledge held in place-based agencies concerning a community's needs across all stages of emergency management. Given this knowledge and community connections, the participants reinforced how place-based agencies were pivotal during the response and recovery and could contribute to planning.

*It's incredibly important for the community to feel empowered in their own recovery to buffer against… developing PTSD [Post Traumatic Stress Disorder] and further embedding of more complex trauma.*
(Study participant)

Participants felt that, when acknowledged by government as an equal in managing emergencies, organisations are in a better position to collaborate effectively with community members, particularly people who may be at risk of being displaced or have difficulty in evacuating. Participants shared instances where this had occurred and how shared expectations increased community resilience. Place-based agencies also have knowledge about appropriate local expertise to enlist. Participants mentioned capacities of accessing resources for rescues, working with local Indigenous representatives and providing recovery and resilience-building support.

*Considering that we don't get funded… we don't respond because that's what the government does… we've had to bear the primary brunt of the response, not just us as an organisation, but our community.*
(Study participant)

Participants also suggested how they could do more with online platforms designed explicitly for managing emergencies. This could help improve communication and assist timely interventions.

*Through this platform, NGOs [non-government organisations] and government agencies could communicate quickly, access and share information, where plans and terms of reference and everything to do with disaster management were kept up-to-date and stored on this platform.*
(Study participant)

Participants explained how the recovery stage continued for longer than was expected. It was identified that resilience comes from building psychological strength within the community. Continuing to build community resilience and mutual aid approaches, particularly in communities more prone to extreme weather events and emergencies, can assist communities to be better placed to support one another and know who in their community can provide a conduit between external resources and community-organised initiatives in future events (McLisky et al. 2025). The participants stated it was important for communities to feel empowered; to have a voice when it comes to their own risk reduction and emergency planning.

*Those of us who are in rural locations…we are the main infrastructure in the town, around human service provision… It takes a whole community to try and respond to something as big as this.*
(Study participant)

## Inclusion of place-based agencies

Participants were insistent that their contribution in the planning of future emergencies is fundamental for wellbeing within their communities. They indicated that place-based agencies often receive limited funding and rely on volunteers and philanthropy to provide their normal services. Therefore, to have the capacity to effectively participate in and contribute to disaster management processes on an ongoing basis, there is a need to consider their capacity and the associated funding requirements for effective engagement and to support the broad range of community needs during and following extreme weather and other hazard events.

*We're trying to argue that we need to be funded.*
(Study participant)

*It took 3 days for the [evacuation] to be officially set up. Because [the government agency staff] couldn't get in here…we were here and supporting the community with limited resources.*
(Study participant)

Participants felt that local agencies were either not given an opportunity to apply for funding or were not offered funding but needed to continue to provide services and respond to needs in their communities.

> *Then 3 [government agency] funded programs came from out of town…staffed by humans with multiple degrees…They don't come with food. They don't come with blankets… Acknowledge and fund who is here already.*
> (Study participant)

Participants felt that place-based agencies played a significant role in emergency management at times critical to the safety and wellbeing of their community. They felt there was a clear argument for local agency inclusion in the formal processes of planning, response, recovery and resilience building.

## Discussion

This study highlighted fundamental roles of place-based agencies in emergency and disaster management. This is because these agencies are commonly the first to respond within the community and because of the knowledge and relationships they hold. It was noted that when place-based agencies had funding for collaboration and resilience projects resulting in increased capacity, that there were improvements during challenging times. The community reliance on place-based agencies when facing difficulties both outside and during times of disaster is a feature of the fundamental role they play in local communities. As they maintain contemporary local knowledge and relationships, they are invaluable resources during the response and also through the long haul of recovery. Gray et al. (2021), Muir (2021) and Rapeli et al. (2018) argue the need for attention on the crucial role place-based agencies have. These agencies are connectors within communities and provide significant mitigation efforts that can enhance resilience in the community. This is amplified when included in risk reduction and emergency planning and are recognised as a partner in response and recovery (Hyunjung et al. 2022).

Place-based agencies can be agile and responsive. As such, they can play a critical role in early response, supporting effective coordination of broader responses at a local level. In this study, once recognised as knowledge holders within their communities, participants said agencies provided a valuable coordination role in directing government services, including the ADF, to people and areas of highest need. Similarly, they were able to assist people in need to receive practical and psychosocial assistance and assist people to access formal recovery services such as those available from recovery centres.

Barton et al. (2020), Curnin and O'Hara (2019) and Scott and Coleman (2016) all recommend including place-based agencies in every phase of emergency management. The Australian Institute for Disaster Resilience (2020) and most Australian states and territories promote this collaboration. However, this study found that the experience and views of local communities are that local councils and government departments fail to include place-based agencies in emergency management planning (Donnuramma et al. 2023; Drennan and Morrissey 2019). This study identified that place-based agencies are not recognised and are often excluded from the response and early recovery coordination processes while actively engaged in and playing a critical role in response and recovery.

Study results indicated the valuable insights local Indigenous groups bring to the planning, response and recovery phases. They can provide expertise in caring for the land and mitigating the local hazard risks. They also provide help and support to their communities by following culturally safe practices. During the 2022 floods, Indigenous groups experienced inappropriate forms of help, there was a lack of trauma-informed and culturally responsive interventions and the use of an authoritarian, directive or 'mission style approach' when supporting flood-affected Indigenous communities (Donnarumma 2023). These findings align with the literature, which supports the inclusion of local Indigenous organisations to provide appropriate assistance to local communities while benefiting the broader community (Ali et al. 2021). Matthews et al. (2020) and Thomassin et al. (2019) point out that the collaboration between the government and place-based agencies leads to successful results (e.g. the Firesticks Initiative and the Caring for Country Initiative).

Failure to include place-based agencies across the phases of emergency management has been an obstacle to resilience-building, slowing the access to local resources and compromising the agility and efficiency that these organisations can provide. The 2022 floods offer an example of the risks of not engaging place-based agencies in risk reduction and emergency management. This is also highlighted in the NSW Flood Inquiry (NSW Government 2023). The inquiry report confirmed the issues identified in the focus groups and identified that excluding local organisations from emergency and disaster management had a negative effect on the response and recovery phases and adversely affected the local communities.

The community and, particularly vulnerable community members, rely on the support of place-based agencies. This reliance is higher and critical in times of crisis. As these findings indicate, the knowledge, community and individual relationships and the trust of community members make a significant contribution to good response and recovery. They are also the community supports that

 

remain after the event. They become valuable resources and their recognition and inclusion in the planning process, as well as post-disaster phases, can enhance emergency planning effectiveness.

While place-based organisations provide a critical, often unacknowledged, role in emergency management, they are overlooked in the planning processes and in the funding arrangements to support their work. In the recovery phase, the additional demands for services result in specific funding, but it was often not equivalent to demand and often not allocated to smaller local agencies.

These findings reiterate the value of inclusion of place-based agencies and their depth of knowledge about community needs over time and across events. They have a significant potential to bolster effective management when acknowledged and included in formal processes. In contrast, significant gaps exist in the planning and initial response when place-based agencies are excluded. Another vital asset they have is an understanding of where at-risk people might be and what kind of specific support might be required. Being involved in a community contributes to both individual and community resilience (Scott et al. 2018). Local community organisations are significant contributors to this and can be valuable contributors if included in emergency management across all phases.

Donnarumma et al. (2023) stated that the role place-based agencies play in emergency and disaster management at a local level is critical and argued for co-planning and inter-agency work as well as for inclusion of place-based agencies and Elders. A newly formulated disaster management framework should include place-based agencies that are adequately funded to address the lessons learnt from the experiences of place-based agencies.

Planning for emergencies may put significant burdens on already overstretched agencies and not all agencies will have the capacity to participate in these processes. In recognition, this paper identifies the existing role many place-based agencies play in responding to community needs. Boetto et al. (2021) indicate that credibility and support, including financial support provided by the government to place-based agencies in disaster management, enhances capacity and can significantly benefit communities. To effectively include place-based agencies as partners in a collaborative and inclusive approach there is a need to acknowledge their role and consider funding required for this additional work. This highlights a central issue of how government and place-based agencies collaborate to provide coordinated and effective planning and recovery. Further research about the role, capacity and support needs of these organisations would be beneficial.

## Limitations

As a qualitative study with a small number of participants and a focus on a specific disaster event and associated responses, there are limitations to the generalisability of the study findings. It is acknowledged that multiple, but not all, place-based agencies in the affected area were participants in this study. Therefore, there is potential bias given the nature of place-based organisations with other perspectives not captured or represented in the study. To minimise bias, the study sought to include organisations that were not associated with the NRFWG or NCOSS. This study occurred during the recovery phase, which may have limited the sharing of perspectives regarding other phases of emergency management. Despite these limitations, insights from this study align with other research and contribute to informing inclusive approaches to emergency and disaster management.

Although there were methodological limitations, the study provided insight into the contributions of place-based agencies in disaster contexts and where additional involvement and resources could improve responses. These insights point to where communities were better supported with funding to improve collaboration and resilience projects and the potential for other improvements.

Further research including a follow-up study on resilience-building and future planning processes in the period 3 to 5 years after the floods would be beneficial to understand the experiences and roles of place-based agencies in emergency management.

## Conclusion

This study strongly points to a need for place-based collaboration with government agencies actively partnering and using local agencies in emergency management. This is supported by research, which demonstrates how the whole community's involvement equates to communities being better equipped to deal with hazards. Existing practice in Australia shows the importance of engagement at a local level for effective community response. For this to occur, governments must provide place-based agencies with opportunities and the support to be involved. Enhanced engagement builds on the potential of positive outcomes where agencies are actively involved in planning, response and recovery activities particular to the local event and community and are given adequate funding to actualise initiatives. This has been shown where place-based agencies could and did make substantial contributions when their role was acknowledged and adequately resourced.

This study showed that while Australian and international practice and contemporary research promotes the engagement of place-based agencies in emergency and

disaster management, this was not the experience in the Northern Rivers floods. A review of the approach and processes implemented across all levels of government for effective engagement of place-based agencies would be beneficial. Bringing these agencies 'to the table' is vital to improve disaster management processes and to better support communities, particularly those in hazard-prone areas.

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## Abstract

Over recent years, many regional and rural communities across Australia have experienced devastating drought, catastrophic bushfires, pandemic, mouse plague and multiple major flood events. A growing body of research has explored children and young people's lived experience of disasters and has highlighted the centrality of local community efforts in recovery. However, recent disaster events have demonstrated an enduring need to build local community capacity to support children and young people's recovery. Between 2021 and 2024, Community Resilience Officers (CROs) were deployed to build capacity in northern, southern and central areas of New South Wales and East Gippsland in Victoria. A developmental evaluation captured the practices associated with Community Capacity Building-Disaster Recovery (CCB-DR) and identified conditions that constrained and enabled these practices in different community contexts. This paper analyses this evaluation data through a socio-ecological lens and identifies 5 policy-relevant recommendations to improve practice. These are flexible funding for right time, right place intervention; involving children and young people in dialogue and decision-making; workforce capacity development; resourcing project leadership; and participatory research and evaluation to inform recovery capacity building interventions.


# Getting the conditions right: building community capacity to support children and young people in regional communities in New South Wales and Victoria

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## Introduction

Natural hazards disrupt the lives of children, young people, families and communities and leave trauma, grief and uncertainty in their wake (Carnie et al. 2011), and people will likely experience similar events throughout their lives (Ebbeck et al. 2020; Peek et al. 2016; Williamson et al. 2020). Disasters affect the social and emotional wellbeing of children and young people, their relationships with family and peers, interactions with school and recreation, housing and neighbourhood cohesion (Alston et al. 2019; Fothergill and Peek 2015). Yet authorities continue to overlook, dismiss and neglect the views of children and young people in decision-making (Mort and Rodríguez-Giralt 2020). This highlights the largely untapped potential of the agency of children and young people in recovery and the need to build the capacities of adults to support and engage with them (Peek and Domingue 2020).

The *Sendai Framework for Disaster Risk Reduction: 2015-2030* (UNDRR 2015) states that, 'Children and youth are agents of change and should be given the space and modalities to contribute to disaster risk reduction' (p.23). The Advocate for Children and Young People in New South Wales (ACYP 2020) also recognises the need for children and young people's empowerment, inclusion, choice, visibility, identity and connections and called for opportunities to

share stories and to participate in recovery. Learning from children and young people can also build social, economic and environmental recognition for future generations (Sadeghloo and Mikhak 2022). MacDonald et al. (2023a) highlighted that the loss, grief and loneliness of young people continues and there remains a need to increase their empowerment in emergency and disaster preparedness.

Children and young people's recovery depends on personal, social, situational, cultural and community factors, and their responses change over time (Gibbs et al. 2014; Mooney et al. 2017; Shepard et al. 2017). However, marginalisation and social exclusion can impair their capacities to navigate events and recover well (Peek and Domingue 2020). In this context, the capabilities of adults to support children and young people's recovery are critical, as is the availability of support (Dyregrov 2015; Freeman 2015; Gibbs 2014; Mooney 2017; Shepard 2017). Community leaders during disasters can help to overcome the barriers of post-event isolation and overwhelmed social infrastructure (Beckham et al. 2023). Caring and supportive relationships also strengthen wellbeing by incorporating ways to cope with stress and grief (Harms 2015). Evaluation of Royal Far West's Bushfire Recovery Program - a community-based program delivering multidisciplinary psychosocial support through 25 primary schools and 12 preschools - found positive mental health and education outcomes were reinforced by improving the trauma-knowledge and confidence of parents, carers and educators (Curtin et al. 2021).

Informal networks of individuals, groups and communities provide practical and emotional support during and after events (Moreton 2018). Their social capital is crucial to mobilise communities and increase safety, trust and recognition, which facilitate cooperation in the aftermath of disasters (Aldrich and Meyer 2015). Families, schools and communities play critical roles in recovery and preparing children and young people to successfully navigate future events (Masten 2021; Sanson and Masten 2023). The organisations that enable children's connections with school, peers, recreation and cultural activities provide opportunities and support for building adaptive capacities (Shepard et al. 2017). These organisations may also have a role in building capacities of caregivers to cope and advocate for children and young people's needs (Fothergill and Peek 2015; Shepard et al. 2017). After disasters, non-government organisations and businesses are uniquely positioned to quickly mobilise resources to support marginalised groups, support coordination and service delivery (Sledge and Thomas 2019).

Such evidence shows the need to explore what is required to build community capacity that supports children and young people's recovery and preparedness. This includes the role of socio-ecological and participatory processes in resilience and sustainability.

### Evaluating community capacity building practices

MacKillop Family Services[1] was funded from 2021–24 to work in 4 disaster-affected regions in New South Wales and Victoria to support the recovery and preparedness of children and young people. CROs were deployed to each region and trained in the Seasons for Growth[2] and Stormbirds[3] programs, which are evidence-based psycho-educational wellbeing programs that help children and young people to navigate change, loss and grief.[4] Evaluators from the Centre for Children and Young People at Southern Cross University were engaged to learn about the practices associated with community capacity building for disaster recovery (CCB-DR) that supports children and young people's recovery and preparedness and the barriers and enablers of practice.

Ethics approval was obtained from Southern Cross University, number 2022/005 in February 2022.

## Methods

Evaluation was informed by a socio-ecological and multi-systems perspective (Masten 2021) and aligned with the Recovery Capitals Framework (Quinn et al. 2022). Inherent in this approach is the value of participatory processes in resilience building and sustainability (Quinn et al. 2022; Sharifi et al. 2017). Developmental evaluation provides evaluative data to inform social innovation related to complex social issues and environments and contributes to action-based learning. Integral to social change projects, developmental evaluation approaches uncover and interpret processes and outcomes to inform learning and decision-making for continuous adaptation (Mitchell et al. 2021). The Theory of Practice Architectures (Kemmis et al. 2014) provided a theoretical and methodological resource to conceptualise and explore practices associated with CCB-DR. Theory of Practice Architectures also supported evaluators to 'zoom in' on practices where they happened and to 'zoom out' to identify the individual, interpersonal, organisational, environmental, cultural and systemic contexts that enable and constrain practices (Nicolini 2012).

Nine reflective practice session groups, each of 1.5 hours with between 2 and 6 participants, were facilitated by evaluators. The groups explored what their communities in each region needed, how CROs might respond and what

1. MacKillop Family Services at www.mackillop.org.au/.
2. Seasons for Growth at www.mackillopseasons.org.au/programs/seasons-for-growth-children-and-young-people/.
3. Stormbirds at www.mackillopseasons.org.au/programs/stormbirds/.
4. Evaluations of the program at www.mackillopseasons.org.au/kb-article-list/?kbc=program%20evaluations.

they learnt. Additional data was collected through 7 semi-structured one-hour interviews and full-day observation of an online workshop. Feedback from children and young people was gathered by CROs during their facilitation of Seasons for Growth and Stormbirds programs and CCB-DR activities. CROs and the project lead also contributed to data analysis. Evaluators initially identified practices and then developed practice descriptions with evaluation participants to ensure accuracy and salience. Findings were synthesised with current evidence to draft recommendations that participants refined for better relevance for their communities.

CROs brought a range of experience to this work. All held relevant degree- or diploma- level qualifications in teaching, psychology or community development. All were trained as Seasons for Growth and Stormbirds program facilitators (called 'Companions'). Table 1 shows the methods, participants and duration of CRO involvement. The authors interpreted and synthesised the findings in light of evolving literature that was informed by the Theory of Practice Architectures and socio-ecological approaches to disaster resilience.

## Findings

### Practices associated with disaster recovery community capacity building

The evaluation uncovered 3 practices associated with CCB-DR: establishing relationships for collaboration, identifying and analysing needs and supporting adults in the lives of children and young people to understand and support recovery and wellbeing.

Table 1: Methods, participants and duration of involvement.

| CRO (project region) | Duration in CRO role | Participated in interview (I), observation (O), reflective practice sessions (RP) |
|---|---|---|
| CRO 1 (NSW central) | 13 months | I + O + 4 x RP |
| CRO 2 (NSW central) | 13 months | I + 4 x RP |
| CRO 3 (NSW northern) | 12 months | I + 4 x RP |
| CRO 4 (NSW central) | 6 months | None |
| CRO 5 (NSW southern) | 9 months | 1 x RP |
| CRO 6 (NSW southern) | 10 months | I + 3 x RP |
| CRO 7 (NSW northern) | 5 months | None |
| CRO 8 (Vic East Gippsland) | 18 months | 3 x RP |
| Project Lead | Project duration | I + 9 x RP |
| Manager | Project duration | I |
| External stakeholder (NSW, central) | NA | I |

**Establishing relationships:** CROs established or developed existing relationships with school wellbeing and learning support officers, educators, principals and deputy principals; Elders and First Nations communities; mental health community workers, counsellors and psychologists; emergency services personnel, welfare service providers, local council recovery personnel and volunteers. Later, relationships were established with children and young people at the invitation of these.

**Needs identification:** The relationships formed the vehicle for ongoing need identification 'on the ground' by listening to people's stories to learn about what had happened locally and important aspects of the community's history and culture. CROs learnt from individuals and networks of people who shared information and strategies. CROs mapped gaps in support to identify the needs of adults and the children and young people in their lives.

**Supporting the supporters:** CROs tailored responses in each community to pilot and improve activities in collaboration with community representatives, the project lead and evaluators. In the early stages of the project, CROs reported ongoing hazards affecting these communities and shared the reports of adults feeling overwhelmed and unable to support children and young people, as the project lead explained:

> *They have the drought, fires, mouse plague, COVID. I have lost track of how many floods that have happened here since then. What we see is that professionals are willing to support children, but they're actually not able to do it at this point in time.*
> (Reflective practice session 2)

Responding to this, CROs initially used psycho-educational approaches to improve the knowledge and skills of adults to support children and young people's recovery. CROs noted the absence of children and young people in many of these interactions, as a CRO described:

> *…there's a real gap in disaster recovery conversations that give children a voice. And last week, working with traditional recovery agencies, who are very much into the practical response… [CRO2] brought it back to the voice of the children and their experience; that is where we have a way in.*
> (Reflective practice session 3)

CROs were invited to directly support children and young people, for example, working alongside staff to deliver Seasons for Growth and Stormbirds or designing new programs (e.g.an ecological grief workshop for young people). Some young people reported this was the first opportunity they had to speak about the effects on them of the 2019–20 bushfires. Their feedback of the

 

CRO Wendy Ronalds facilitated the workshop in East Gippsland, Victoria.

Image: Tim Pace

program was overwhelmingly positive (see https://vimeo.com/842783362/49d341daba).

Practice encompassed:

- raising awareness about children and young people's participation, recovery and wellbeing
- piloting and refining psycho-educational loss, grief and recovery workshops and training
- reconnecting people to build hope at individual, family and community levels.

A workshop designed for mental health practitioners who are supporting children and young people was adapted for local hospital staff recovering from pandemic-related effects. The workshop was redesigned for disaster recovery personnel and parents/carers and then for children and young people. Rather than 'doing for', where conditions allowed, the CROs mobilised, co-facilitated and supported adults from the local community or school to deliver the Seasons for Growth and Stormbirds programs with multiple student cohorts simultaneously. This provided an opportunity to reach a large proportion of students while building capacity of the adults in their lives. In other settings where adults' capacities were over-stretched, CROs delivered the programs directly with children and young people themselves.

## Conditions enabling and constraining CCB-DR practices

The conditions that enabled and constrained CCB-DR practices related to the systemic, environmental and organisational arrangements like funding specifications, ongoing effects of disasters and the pandemic, organisational culture and capacity, and the evidence base informing this research. All evaluation participants identified the constraint of limited funding that prevented organisations from being able to pivot support to those places where the conditions and timing were right for the community. As CRO 3 stated:

> *Funding is offered for certain areas, or for certain fires, floods. But you can't anticipate what's coming up in the future. It probably needs to be a rolling CRO who can be movable into communities as and when needed, because I felt like I was perched on the side.*

Timing is a constant constraint on CCB-DR practices. The COVID-19 pandemic restrictions and ongoing disaster events affected people in most of the New South Wales project, limiting community resources and requiring New South Wales-based CROs to pull back from CCB-DR practices to attend to urgent requests for support. Sensitivity to time between disaster events was important for CRO 8 who was working in small East Gippsland communities during 2023 and 2024:

> *These towns are really struggling. You know, it's only 4 years and that is nothing in terms of being along the journey. Four years stills feels like it could have happened a few months ago, you know. And the world's tipped upside down since then.*

Interpersonally, conditions enabling CCB-DR practices were the quality of local stakeholder relationships, working face-to-face and the team's sensitivity to the 'right time' for interventions.

Organisationally, there was consensus among evaluation participants that project leadership, team collaboration and group reflective practice sustained the hope and motivation of CROs to 'stick with it'. The project lead role was not funded in the project but was internally funded in response to the complex barriers CROs faced in New South Wales. CROs appreciated the 'willingness to let me immerse myself into the role in my way… that would probably be the most significant' (CRO 2). Another CRO noted, 'We've got a team leader who values people more than targets… we're really, really lucky like that'.

The quality of relationships with external stakeholders was another enabling condition. Being attuned to the exhaustion that existed within the community, CROs were still able to maintain and deepen relationships despite the 'pure exhaustion' and 'overwhelm' they witnessed. For example, CRO 6 witnessed Elders in a southern New South Wales community calling for support at a local meeting in 2022. Over months, she supported multiple responses, including co-facilitating a culturally adapted loss and grief program with the local First Nations community.

On an individual level, CRO capabilities that assisted CCB-DR included:

- adapting and being flexible
- being embedded within the community
- using trauma and healing-informed practice
- amplifying the voices of children and young people
- having knowledge and skills in CCB-DR.

Analysis of these conditions highlighted the critical systemic funding and environmental conditions that are out of the control of local community organisations. This illustrates the individual, interpersonal and organisational factors that fund support of CCB-DR practices.

## Recommendations: getting the conditions right

This evaluation provides insights into the practices for building community capacity to enable children and young people's recovery and resilience. In particular, ways of relating and offering support that lay the groundwork for recovery and resilience. These findings suggest that CCB-DR practices can be improved by setting up the enabling structural, environmental, organisational, family, community and individual conditions and minimising conditions that constrain those efforts. Reflecting on these findings and the available literature, 5 recommendations are offered to set the conditions for improved CCB-DR practice (see Figure 1).

### Provide flexible funding to enable right time, right place intervention

As disaster events impact on regional communities and we learn more about what is needed for recovery for communities, families and individuals, flexible funding arrangements could enable organisations to identify and respond appropriately to need and build assets, networks and resources in communities as required. Availability of funding at the 'right time' and 'right place' would enable deployment of CCB-DR practitioners practiced in inter-generational recovery and wellbeing. Organisations need to have long-term connections in communities where socially and economically disadvantaged and marginalised populations have a high likelihood of natural hazard exposure.

### Involve children and young people in inter-generational dialogue

Advocates consulting with children and young people affected by disasters urge young people's inclusion in service design and decision-making (ACYP 2020, 2024; YACVic 2020). Their participation is positively associated with their wellbeing across social, economic and cultural life (Graham et al. 2022; Quinn et al. 2022) and models to enhance their involvement are available (Heffernan et al. 2024; Mort et al. 2018). Yet, according to Healthy North Coast (2023), disaster-affected children and young people report they 'want a voice and a say in decisions. Many feel as though young people are being ignored' (p.10).

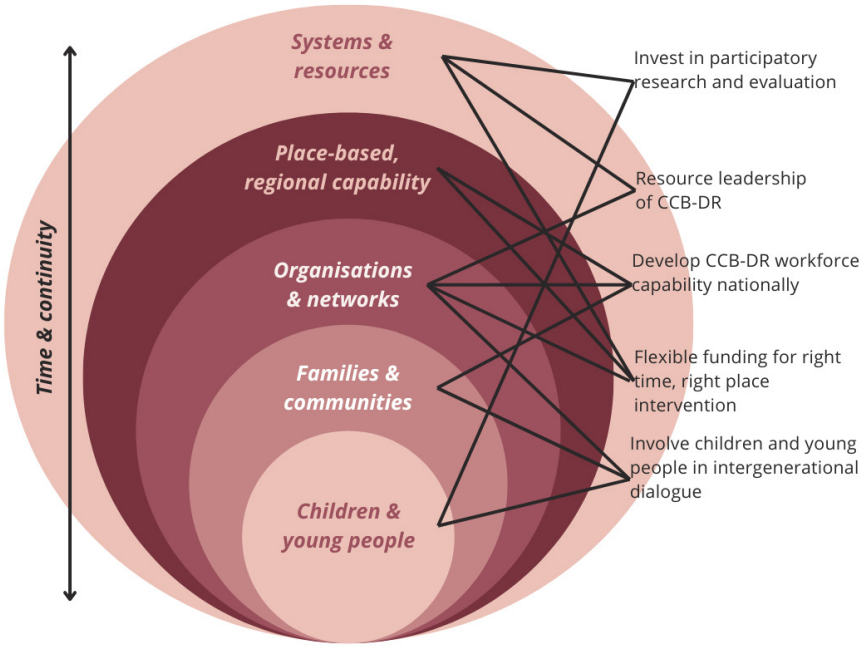


Figure 1: Recommendations to improve CCB-DR practices to enable the recovery and wellbeing of children and young people.

 

This suggests that still more is needed to achieve inter-generational dialogue and participatory decision-making.

Setting these conditions involves:

- recognising the rights and agency of children and young people
- supporting diverse views
- listening and participating in inter-generational dialogue
- acting on the ideas offered by children and young people.

### Develop workforce capability

CCB-DR practitioners need to be knowledgeable and skilled and committed to the communities where they are deployed. They must have relevant experience, including fostering the wellbeing and participation of children and young people. We recommend a national workforce capability project to develop these capabilities in workers and volunteers. Developing CCB-DR competencies could provide a pathway for recognition of community leaders and communities-of-practice will further support communication, learning and innovation.

### Resource project leadership

Working across multiple disaster-affected regions, CCB-DR practitioners need project leaders who can motivate, support and resource them. Senior CCB-DR practitioners need capabilities in mental health and wellbeing, project management, staff support and research and policy knowledge. Investment in CCB-DR leadership provides a pathway from practice to future sustained innovation and policy contribution. We recommend resourcing of CCB-DR project leadership within, or alongside disaster grant rounds.

### Invest in participatory research and evaluation

Investment is needed in participatory, developmental and inter-generational research and evaluation to understand the adaptation factors of climate-related hazards in regional and rural communities. A key finding from this project was the way CCB-DR practices strengthen the relationships and connections between adults, children and young people. This could be explored in inter-generational research and evaluation on a larger scale. While this was a small-scale qualitative project and, as such has limited generalisability, larger-scale mixed methods evaluation involving children and young people would be particularly beneficial.

## Conclusion

This study analysed evaluation data through a socio-ecological lens and identifies 5 policy-relevant recommendations to improve CCB-DR practice. The study evaluated CCB-DR practices in a number of communities in regional and rural New South Wales and Victoria that were exposed to multiple natural hazards like bushfire, drought, flood and pandemic. CCB-DR can be enhanced by improvements in flexible funding for right time, right place intervention; by involving children and young people in dialogue and decision-making; by implementing specific-skills workforce development; by resourcing project leadership and by participatory research and evaluation to continually improve recovery capacity building interventions.

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## Abstract

Natural disasters, such as bushfires and floods, frequently impact Australian communities and lead to significant legal challenges for affected individuals. This paper examines the patterns of legal service utilisation by people affected by such events using data from a statewide provider of free disaster-related legal assistance. This research presents findings on 6 primary legal issue categories of insurance, grants, tenancy (loss of dwelling), tenancy (not loss of dwelling), goods and services, and environment/ neighbours. The findings suggest that assistance for different types of legal issues is requested at different stages of the recovery process. The analysis highlights the importance of timely and tailored legal assistance to support recovery and resilience. By understanding these patterns, policy makers and service providers can better allocate resources to improve access to necessary support by affected individuals. This research contributes to the understanding of the legal dimensions of disaster recovery and underscores the critical role of legal assistance in response and recovery. Given that many people seek non-legal assistance when resolving legal problems, these results are also relevant for government and community service organisations that provide non-legal support to people experiencing these types of problems post-disaster.


# Timing of disaster-related legal assistance in New South Wales: trends in service utilisation for common legal problems following flood and bushfire

Peer reviewed


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## Introduction

Natural disasters such as bushfires and floods are recurrent challenges in Australia and often leave communities devastated and in need of variable forms of support (Commonwealth of Australia 2020). While the immediate aftermath of a disaster typically focuses on physical recovery, an often-overlooked aspect is the significant legal challenges that affected individuals face (Balmer et al. 2023; McDonald 2023; Kothe et al. 2024). These challenges can range from issues with insurance claims and tenancy disputes to navigating government grants and dealing with consumer rights. In Australia, legal assistance services play a critical role in helping disaster-affected individuals navigate these complex issues (Australian Pro Bono Centre 2023), improving access to necessary resources and justice.

The legal needs of people affected by such events are multi-faceted and can have long-lasting consequences if not addressed in a timely and effectively manner (Coumarelos et al. 2012). Research indicates that unmet legal needs can exacerbate the financial and emotional stress people experience, which can lead to adverse outcomes (Currie 2007; Pleasence 2006; Pleasence et al. 2010). For instance, individuals facing insurance disputes may struggle to secure adequate housing or replace lost possessions, while others might encounter barriers to accessing government aid due to bureaucratic complexities (McKenzie et al. 2022).

In response to such issues, legal assistance providers seek to meet this need through disaster-specific legal outreach (Bushfire Legal Help 2010; Hipkin 2021; Star and Sutton 2021). These programs aim to provide timely legal advice and assistance, and help individuals to understand and exercise their rights in the aftermath of a disaster. The effectiveness of these services is crucial as they not only assist in immediate recovery but also contribute to the long-term resilience of communities.

Understanding demand for disaster-specific legal outreach services and the presentation of people with different legal problems over time will assist in service planning and delivery. The effects of these legal issues can be expected to impact demand for non-legal services too. Research by the Victoria Law Foundation showed that many people with legal problems access non-legal help for those problems (Balmer et al. 2023; McDonald 2023) and that many disaster-related legal problems also impact demand for support from other community service providers and government agencies (especially relating to housing, insurance and government benefits). As such, understanding the patterns of presentation for different problems over time has implications for non-legal service providers.

This paper explores the patterns of legal service utilisation by people affected by natural disasters using data from a New South Wales statewide provider of free disaster-related legal assistance. By examining how different types of legal problems present over time following events like bushfires and floods, this study provides insights that can enhance service delivery and policy planning. Understanding these patterns is essential development of targeted support strategies that address the unique legal challenges faced by people impacted by disasters. This ultimately contributes to more robust recovery processes. Given that: (a) different types of problems are likely to present at different times in the post-disaster period and (b) the legal problems people experience is known to be associated with the type of natural disaster (Kothe et al. 2024), trends in service utilisation were examined for the most common legal matters associated with legal assistance after bushfire and flood events.

## Methods

Data were obtained from Legal Aid NSW about all legal services provided to individuals from the Disaster Response Legal Service[1] between January 2020 and December 2023. Unit record data were provided in a de-identified form and underwent data validation and cleaning prior to analysis (see Kothe et al. 2024 for a detailed description of data cleaning and validation). The Disaster Response Legal Service model and underlying theory of change has been described by Hipkin (2021).

### Variables of interest

#### Matter group and matter type

Services provided by the Disaster Response Legal Service can relate to multiple legal matters. In the data provided for this series of analyses, information about all matter types recorded for each service was extracted.

In this dataset, each legal problem was assigned a 'matter group' and a corresponding 'matter type'. Matter types provided a more detailed description of the specific nature of the problem than the matter group. For example, where a person has a legal problem relating to their consumer rights and protection as a consumer of goods and/or services the matter group 'goods and services' would be assigned. Within this, there were more detailed matter types that could be recorded. For example, in the case of the 'goods and services' matter group, the matter types provide detail about the type of good or service a person was experiencing a problem with (e.g. 'energy and water utilities' or 'motor vehicle purchase and services').

Matter groups and matter types are standardised across Legal Aid NSW. As such, some distinct disaster-related legal issues share a single matter type that lacks specificity. For example, the matter type 'state disaster relief grants' encapsulates all disaster grants funded by the New South Wales Government including the Disaster Relief Grant and Resilient Homes Program even though the value of these grants and their expected timing in the post-disaster period varies substantially.

Across the services to individuals provided by the Disaster Response Legal Service in response to natural disasters since 2020, 41 different matter groups and 159 different matter types were reported at least once. However, most of these matter groups and types were only infrequently recorded. In this paper, we focus on 6 of the most frequently occurring legal problems: (1) insurance (2) grants (3) tenancy - loss of dwelling (4) tenancy - not loss of dwelling (5) goods and services and (6) environment/ neighbours.[2] Table 1 provides a description of the matter types that constitute these matter groups.

#### Time since disaster

The time between the date of the first service for a given disaster event and the date of each service for that event was calculated for the purpose of this analysis. The date of the first service was used as a proxy for the activation of the legal service for each event. This provides an estimate of the time between when a person was impacted by the disaster and when they accessed legal assistance. This estimate is less reliable for the 2019–20 bushfires since all

1. Disaster Response Legal Service NSW at https://disasterhelp.legalaid.nsw.gov.au/.
2. Matter group names are not the matter group names used by Legal Aid NSW. They have been edited to increase readability and clarity for a non-legal audience.

Table 1: Matter groups analysed in this report and their constituent matter types.

| Matter group | Matter types within matter group |
|---|---|
| Insurance | General insurance (98.5%)<br>Life insurance (1%)<br>Superannuation (<1%)<br>Funeral - future provision (<1%) |
| Goods and services | Energy and water utilities (14.2%)<br>Motor vehicle purchase and services (11.4%)<br>Telecommunication service (8%)<br>Financial services including pawnbrokers/credit report/debt management (3.1%)<br>Education services (2.6%)<br>Other goods and services (61.9%) |
| Grants | State disaster relief grants (97.5%)<br>Commonwealth disaster relief grants (3.5%) |
| Tenancy - loss of dwelling | Other loss of dwelling (not by credit obligation) (59.7%)<br>Private eviction - no grounds (17.5%)<br>Eviction - residential park/boarding house/ retirement village (11%)<br>Private eviction - breach (not arrears) (5.2%)<br>Private eviction - rent or water arrears (3%)<br>Eviction - denial of equitable rights/ judicial review (2.4%)<br>Social housing eviction - breach (not arrears) (2.1%)<br>Social housing eviction - no grounds (<1%)<br>Social housing eviction - eligibility (<1%)<br>Social housing eviction - rent or water arrears (<1%) |
| Environment/ neighbours | Local government/planning (42.7%)<br>Fences/ trees/animals (40.2%)<br>Neighbour dispute - other (12.1%)<br>Noise/nuisance /pollution (6.3%)<br>Public interest environment (1.8%) |

bushfires in that season were recorded as a single disaster event, even though the bushfires occurred over several months. It was not possible to identify the individual bushfire event to which each service related based on data available to the authors. However, the bulk of services were delivered in the immediate aftermath of legal assistance activation for the 2019–20 bushfire season (i.e. in January to February 2020).

Both 'time in days' and 'time in months' were calculated. To calculate time in months, the number of days since the disaster was divided by 30.44, and the result was rounded down to the nearest whole number. For example, services delivered within the first 30 days were classified as 0 months since the disaster, those delivered between 31 and 61 days as 1 month since the disaster, and so on.

### Disaster type

The Disaster Response Legal Service was activated to respond to numerous natural disasters between 1 January 2020 and 31 December 2023. Table 2 shows the number of services associated with each individual event; flood-related events also included damage from storms that occurred in the same period.

### Analysis plan

Data from bushfires and floods were analysed separately to avoid introducing misleading interpretations of service utilisation over time. The earliest flood event in the dataset occurred in 2021, meaning that only up to three years of post-flood data is available. Combining flood and bushfire data could create the false impression that flood-related problems no longer occur after three years, when the data does not include that period. This distinction is important, as earlier analysis has shown that some types of legal problems are more commonly associated with flooding (Kothe et al., 2024). Analysing each disaster type separately provides a clearer understanding of service use over time, while also accounting for the limits of the available data.

Based on desktop review, it appeared likely that the matter types that comprise the environment/neighbours matter group may exhibit different trends in service utilisation over time. Therefore, for this matter group, data was also analysed at the matter type level, comparing the 2 most common types: 'fences/trees/animals' and 'local government/planning'.

Key descriptive statistics were calculated for service utilisation across each matter group. Specifically, the time taken (in days) to deliver 25%, 50% and 75% of services for each matter group was determined. Data for the 100% quartile was not presented since the legal service continued to provide services for each disaster in this dataset. Additionally, the time taken (in months) to reach both peak and trough service utilisation for each matter group was computed. The calculation of peaks and troughs required the use of monthly data due to variations caused by day-of-the-week effects. However, daily data was used for quantile reporting to provide sufficient granularity.

Density plots were used to visualise the distribution of service utilisation over time across different matter groups. These plots provided a smoothed estimate of the probability density function for the continuous variable of

Table 2: Number and proportion of services by disaster event.

| Disaster event | Number of services | % of total services |
|---|---|---|
| March 2022 floods | 4,787 | 55.6 % |
| 2019–20 bushfires | 1,471 | 17.1 % |
| 2021 floods | 932 | 10.8 % |
| October 2022 floods | 918 | 10.7 % |
| July 2022 floods | 409 | 4.8 % |
| 2023 bushfires | 87 | 1.0% |
| **Total** | **8,604** | **100%** |

 

interest; in this case, the time taken for service utilisation. The x-axis of each density plot represents the time taken (in months) for a person to seek a legal service. The y-axis indicates the relative probability of service utilisation occurring at different time intervals. By examining the peaks, spread and tails of the density curves, patterns in service delivery times and areas of high concentration (indicating frequent service delivery times) can be identified and variability across different matter groups can be compared. For instance, a high peak suggests a high concentration of service delivery times around a given month, while the width of the curve reflects the variability in those times. Long tails indicate the presence of outliers or extended service delivery periods. Caution should be taken in interpreting density plots where there are prolonged gaps in service provision. Trends in service utilisation across matter groups was conducted through visual comparison of density plots and through consideration of service utilisation statistics.

## Results

Of the 8,604 services delivered by the Disaster Response Legal Service in the data collection period, 7,445 (90%) of services related to the matter groups of interest. Given the potential for a given service to relate to multiple matters, this data accounted for a total of 8,478 legal matters.

### Flood

Figure 1 shows service utilisation for flood-related services by matter group. In this figure, the area shaded grey on each plot represents values of months since the disaster that are not possible given the time the first flooding event was recorded (i.e. values beyond 21 months). These values are included on the plots to facilitate visual comparison between this plot and the bushfire density plots by maintaining a consistent scale for the x-axis. There are clear differences in trends in service utilisation over time for flood-related services based on the type of legal problem a person experienced. While all matter groups demonstrated an initial surge in service utilisation shortly after the disaster event, how problems continued to play out over the medium to long-term varied as a function of matter group.

### Bushfire

Figure 2 shows service utilisation by matter group for bushfire-related services. As with flood-related services, visual inspection shows marked differences in service utilisation trends over time. Only 3 matter groups demonstrated sizeable peaks in service utilisation in the immediate post-disaster period. The probability density for service utilisation for goods and services and environment/neighbours was distributed across the response and recovery period. While the density plot for grant-related matters is included for completeness, given the small number of services related to this matter group following bushfire and issues relating to the recording of this data (discussed in further detail below), we have not included detailed analysis bushfire grant-related matters in this report.

### Goods and services

Overall, 397 services were provided relating to goods and services. Most were classified as 'other goods and services' with services relating to utilities, telecommunication providers and purchase and service of motor vehicles also common.

Legal needs survey data shows that people frequently deal with goods and services problems alone or with informal support from family and friends (Balmer et al. 2023). Where people do seek help from others to solve problems of this type they are more likely to use a non-legal source of assistance than to receive independent legal help (Balmer et al. 2023). Common sources for legal help for goods and services related problems include internal complaint and dispute resolution processes, industry specific ombudsmen and dispute resolution services as well as government agencies such as the Department of Fair Trading and the Australian Competition and Consumer Commission (Coumarelos et al. 2012).

#### Services related to floods

There were 292 services associated with goods and services following a flood. Figure 1 shows a clear peak in goods and services related legal services for flood impacted people. This peak occurs later than for other services and the decline in service utilisation after the peak is relatively slow. This is confirmed by descriptive statistics that show that the peak of service utilisation was at 2 months after the disaster. A quarter (25%) of services had been delivered by 53 days following the disaster, 50% were delivered by 94 days and 75% were delivered by 226 days.

#### Services related to bushfires

There were 105 services associated with goods and services following a bushfire. Figure 2 does not demonstrate an obvious post-bushfire peak and services related to goods and services spread across much of the post-disaster period. The peak of service utilisation was at one month after the disaster. The first month with no services delivered was 6 months post-event. A quarter (25%) of services had been delivered by 53 days post-disaster, 50% were delivered by 367 days and 75% were delivered by 517 days.

### Insurance

Overall, 4,482 services were provided relating to insurance. For both flood and bushfire, the vast majority of these

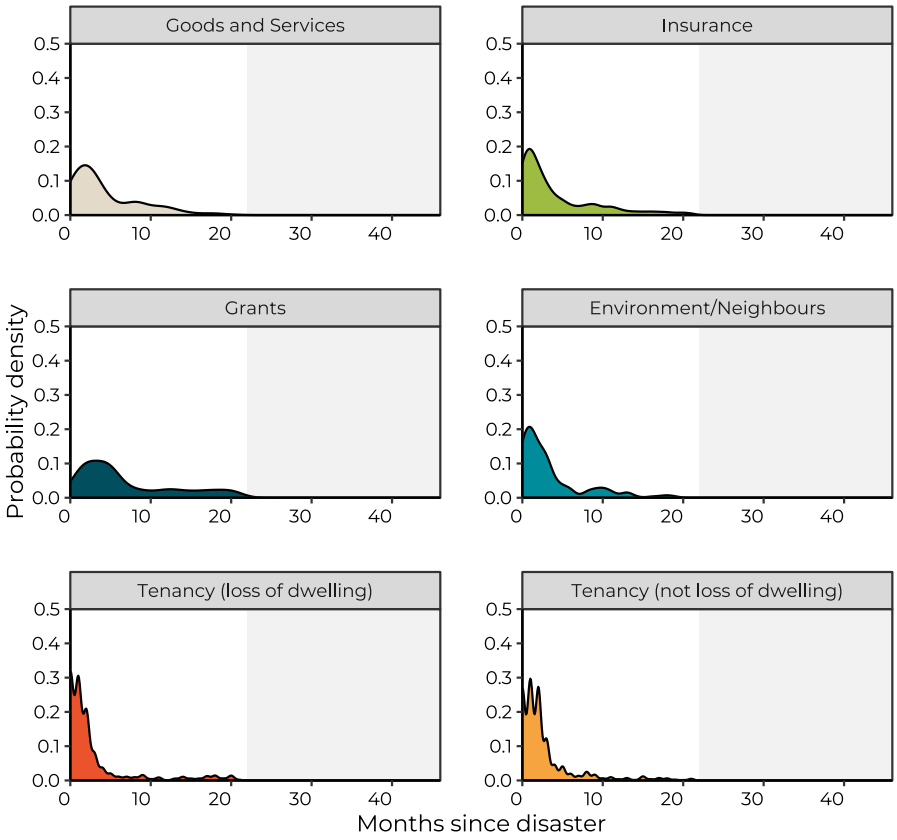


Figure 1: Probability density of post-flood service utilisation by matter group.

services related to the 'general insurance' matter type that includes home insurance, home and contents insurance and vehicle insurance.

People with insurance disputes engage in both internal dispute resolution processes through their insurer and, less commonly, escalate disputes to the Australian Financial Complaints Authority. Both legal services and financial counsellors report providing support to people engaging in dispute resolution processes (Australian Financial Complaints Authority 2023; Legal Aid NSW 2023; Financial Counselling Australia 2023). Given the financial consequences of a denied or delayed insurance claim, it is not surprising that other social services also commonly provide material and psychological support to people experiencing insurance problems. For examples of the contribution of social workers supporting people experiencing issues with insurance, see Alston et al. (2019).

### Services related to floods

There were 3,661 insurance services associated with a flood event. Figure 1 shows a notable post-disaster peak in insurance services with continued service utilisation across the entire post-flood period. This is consistent with the descriptive statistics that demonstrate that insurance services peaked at one month post-disaster and there was at least one insurance service in every month represented in the dataset. A quarter (25%) of insurance services had been delivered by 44 days post-disaster, 50% were delivered by 79 days and 75% were delivered by 196 days.

### Services related to bushfires

There were 821 insurance and superannuation services associated with a bushfire event. Figure 2 shows a post-disaster peak with a relatively rapid decline in service utilisation. Nevertheless, there is demand for insurance services across the entire post-disaster period. Indeed, descriptive statistics show that insurance services peaked in the first 30 days of a bushfire. The first month with no insurance services delivered was 25 months after the event. A quarter (25%) of services had been delivered by 24 days post-disaster, 50% were delivered by 47 days and 75% were delivered by 139 days.

## Grants

Services related to grants accounted for 1,450 legal services provided by the Disaster Response Legal Service. Most services related to NSW Government grants. People who experience problems with grants may also require additional engagement with government departments

 

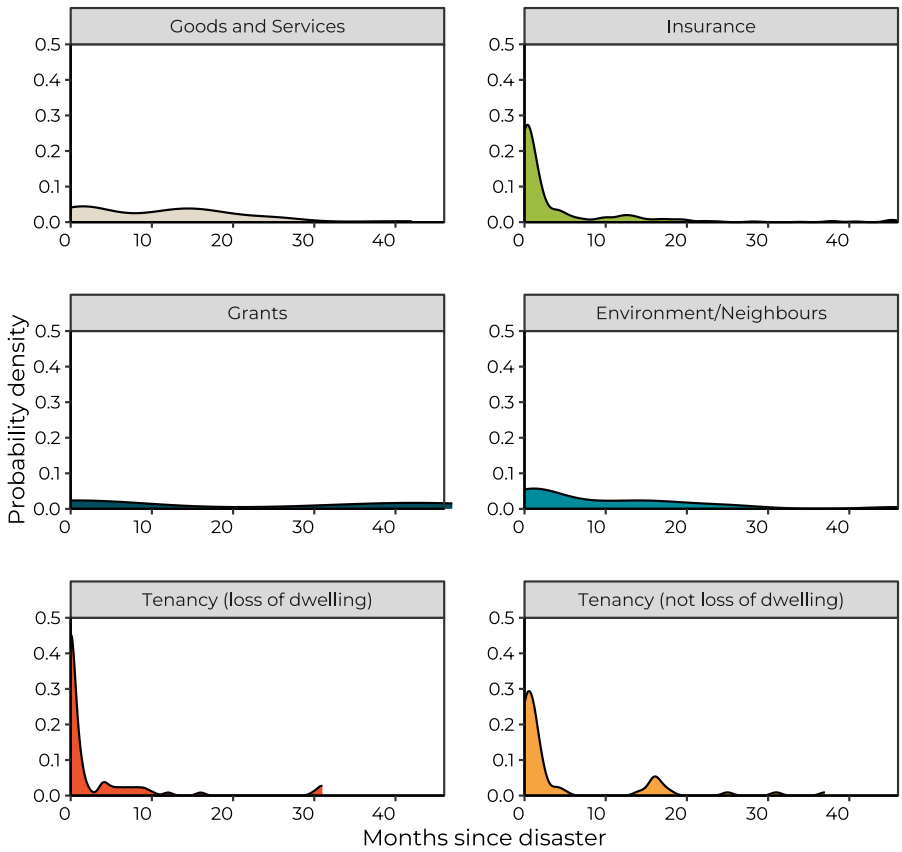


Figure 2: Probability density of post-bushfire service utilisation by matter group.

responsible for grant administration and with social services that provide material and psychological support.

While all problem types demonstrate a long tail with sustained service utilisation beyond the initial disaster response period, this is especially marked for problems relating to government grants and environment/ neighbours.

### Services related to floods

Grants accounted for 1,411 services provided to flood impacted individuals. Descriptive statistics show that demand for grant-related services peaked at 2 months post-flood. A quarter (25%) of services had been delivered by 84 days, 50% were delivered by 166 days and 75% were delivered by 336 days.

### Services related to bushfires

Grants accounted for only 39 services delivered to bushfire-impacted individuals. There were no services delivered relating to this matter group between 3 months and 24 months post-disaster. The small number of recorded services was not surprising given that many grant schemes that account for the flood-related grant services were established in response to major flooding events and were not available for the bulk of bushfire-impacted individuals (National Emergency Management Agency 2024; Kothe et al. 2024). A further issue is that the grant matter group was not available in the Legal Aid NSW data management system immediately following the 2019–20 bushfires. As a result, these matters were provisionally recorded using the matter group 'Other civil (state) - Civil other – state'. This code is also applied for a range of other civil law problems. While manual re-coding of this provisional coding was conducted once the grant matter group became available, it is possible some services were missed in the process. Because of the low number of total services, the potential for missed cases has disproportionately high impact on the interpretability of these findings. Given this, we have not included analysis of the grant matter group following bushfire in this paper. The analyses of this data over time has a high likelihood of providing misleading information about the trends in services that would be expected following future bushfires.

## Environment/neighbours

There were 410 services related to the environment/ neighbours matter group delivered by Disaster Response Legal Service. This matter group was dominated by 2 matter types; local government/planning and fences/trees/ animals. Since the desktop review had identified that these matters may have different trends in service utilisation over

time, the data for this matter group were also explored at the matter type level for these two matter types.

Problems relating to this matter group were likely to result in engagement with a range of non-legal advisers, most notably with local government given the large number of issues relating specifically to local government and planning. Other government agencies with responsibility for planning approval or dispute resolution are also likely to experience increased utilisation following a disaster. For those legal problems that relate to neighbours (e.g. fencing and stock control issues), people may also seek help from NSW Civil and Administrative Tribunal (or other equivalent bodies in other jurisdictions) with or without legal assistance.

### Services related to floods

There were 218 flood-related services associated with the environment/neighbours matter group. Figure 1 shows a peak in service utilisation in the immediate post-disaster period followed by steady decline in services delivered. There appears to be a small increase in service utilisation at around 12 months after the flood. The descriptive data shows that the peak in service utilisation occurred one month post-flood. A quarter (25%) of services had been delivered by 36 days, 50% were delivered by 78 days and 75% were delivered by 135 days.

There were 115 services associated with the local government/planning matter type post-flood. A quarter (25%) had been delivered by 27 days, 50% were delivered by 67 days and 75% were delivered by 135 days. Only 42 services relating to fences/animals/trees were delivered post-flood. A quarter had been delivered by 55 days, 50% were delivered by 87 days and 75% were delivered by 132 days.

### Services related to bushfires

There were 192 services relating to environment/neighbours delivered following bushfires. Figure 2 shows consistent demand relating to this legal problem type with only a small peak in the initial post-disaster period. The peak in demand is more clearly identified in the descriptive data, which showed a peak in demand in the first 30 days post-bushfire and the first month. The first month with no environment/neighbour related services was 7 months after the event. A quarter (25%) of services were delivered by 31 days, 50% were delivered by 168 days and 75% were delivered by 496 days.

There were 56 services relating to environment/neighbours post-bushfire associated with the local government/planning matter type. It took until 255 days post-disaster for a quarter of these services to be delivered, with 50% delivered by 500 days and 75% delivered by 619 days. In contrast, of the 117 services relating to fences/trees/animals post-bushfire, a quarter (25%) had been delivered by 30 days, 50% were delivered by 49 days and 75% were delivered by 289 days.

### Tenancy (loss of dwelling)

Tenancy (loss of dwelling) accounted for 691 services. Most services in this matter group were coded as 'other loss of dwelling (not by credit obligation)'. Services related to 'no grounds' eviction from private tenancies and evictions from caravan parks, boarding houses and retirement villages were also common.

Where people experience a loss of dwelling due to a tenancy-related problem, this will lead to demand for services from housing and homelessness providers, tenant's advocacy services and dispute resolution processes such as the NSW Civil and Administrative Tribunal (or other equivalent bodies in other jurisdictions) (van den Nouwelant and Cibin 2022; Cortis and Blaxland 2022).

Flood-related tenancy services may be slightly delayed relative to bushfire services. This is likely a reflection of the different impacts these disasters have on housing stock and different dynamics in housing markets in areas that have been disaster-impacted.

### Services related to floods

There were 609 services associated with tenancy (loss of dwelling) associated with a flood. Figure 1 shows rapid initial demand that peaks in the first 30 days post-flood and remains at high levels for 2 months after the flood. Service utilisation for this matter group is maintained at lower, but non-zero, levels for most of the data collection period. Descriptive data show that services peaked in the first 30 days post-disaster. The only month with no tenancy (loss of dwelling) services was 12 months after the flood. A quarter (25%) of services had been delivered by 23 days post-disaster, 50% were delivered by 53 days and 75% were delivered by 87 days.

### Services related to bushfires

There were 85 services associated with tenancy (loss of dwelling) following a bushfire. Figure 2 shows a large initial peak in the 30 days post-bushfire followed by a rapid decline in service utilisation. Descriptive data show that services peaked in the first 30 days post-disaster. The first month with no tenancy (loss of dwelling) services was 3 months after the bushfires. A quarter (25%) of services had been delivered by 19 days, 50% were delivered by 27 days and 75% were delivered by 69 days.

## Tenancy (not loss of dwelling)

Tenancy (not loss of dwelling) accounted for 1,048 services. The most common matter type was 'repairs

 

and maintenance', but 'other tenancy dispute' and issues relating to caravan parks, boarding houses and retirement villages were also common.

Where people experience a tenancy-related problem that does not directly result in the loss of a dwelling, this will lead to demand for services such as tenant's advocacy services and dispute resolution processes such as the NSW Civil and Administrative Tribunal (or other equivalent bodies in other jurisdictions). Although this category of legal matter does not directly lead to the loss of a dwelling, where problems cannot be resolved (e.g. where essential maintenance is not performed) there is likely to be downstream demand for services from housing and homelessness providers.

The data related to this matter group and to the tenancy (loss of dwelling) matter group previously described suggests that the long tail may be less marked for tenancy-related issues. This appears to result in less sustained service utilisation. Over 75% of services were delivered within the first 100 days post-disaster. However, it is important to recognise that housing and tenancy services should expect people to still be experiencing problems relating to their housing long after the disaster.

### Services related to floods

There were 980 services associated with a tenancy issue that did not lead to the loss of a dwelling following a flood. Figure 1 shows an acute surge in demand during the initial post-disaster period, characterised by a sharp and pronounced peak that declines rapidly but remains above zero throughout the post-flood period. The descriptive data show a peak service utilisation at one month post-flood and there are no months with zero tenancy (not loss of dwelling) services delivered. A quarter (25%) of services had been delivered by 34 days, 50% were delivered by 63 days and 75% were delivered by 100 days.

### Services related to bushfires

There were 68 services associated with tenancy (not loss of dwelling) matter group. A quarter (25%) of services had been delivered by 23 days, 50% were delivered by 46 days and 75% were delivered by 76 days. No services were recorded between 6 and 13 months, making the interpretation of the density plot unreliable.

## Discussion

The findings from this study highlight the significant and varied legal needs that arise in the aftermath of bushfires and floods in New South Wales. The data underscore that assistance for different types of legal issues is requested at different stages of the recovery process. It is well known that there is an initial surge in demand for services in the immediate post-disaster period (Kothe et al. 2024). While these trends in service utilisation are partly a function of the availability of services and outreach activities, this data suggest that the surge is observed for most issues. Legal service providers and other services that provide help to people impacted by these problems are likely to experience an initial surge in demand following disaster. This surge appears especially rapid for tenancy-related needs while other problems may have a slightly delayed onset.

While all problem types demonstrated a long tail with sustained service utilisation beyond the initial disaster response period, this is especially marked for problems relating to local government and planning and state government grants, which are characterised by low but persistent service utilisation across the post-disaster period. Insurance also showed a very long tail of service utilisation with some people presenting to services for the first time more than 40 months after the event. While the proportion of services relating to insurance long after the disaster is lower than the proportion of long tail planning and grant services, the relatively large number of services related to this matter group means that type of legal problem dominates long tail service delivery.

This time-based variation in service utilisation points to the necessity for a dynamic and responsive legal assistance framework that can adapt to the evolving needs of disaster-impacted populations. Legal service providers must be equipped to handle a diverse range of issues, from immediate post-disaster claims to long-term recovery support. Legal assistance providers and community service organisations that help with these problem types should plan service delivery with expectations about the likely timing and duration of service delivery based on the types of problems that they assist with.

Policy makers and service providers should consider these findings to better plan and allocate resources, so that legal and related non-legal services are accessible and effective throughout the entire recovery phase. In particular, government responses relating to preparedness should be shaped by the expectation that many people will continue to have issues that require assistance from local or state government for years following a disaster.

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# Placemaking as a catalyst for building resilience: co-designing social infrastructure with high-risk communities

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## Introduction

'Place' is an unequivocal aspect of people's experiences of disaster. From phenomena such as 'topophilia' marking people's love of place (Barton 2017) and 'solastalgia' capturing one's sorrow of its destruction (Barton 2017), processes that shine a light on rehabilitating places to build resilience and prepare for disasters are critical. These highly sensory and environmental experiences of disaster strongly relate to First Nations perspectives on connecting with Country and offer a decolonised view of space as inherently linked to time (Smith 2012); a process and not only an outcome (Massey 2012). Such ways of thinking about place supports and accelerates the movement towards place-based programs and community-led processes.

Government, not-for-profit and philanthropic organisations in Australia are increasingly turning to place-based approaches, acknowledging that a collaborative and community-led focus can generate shared understandings that can unlock systemic issues. Place-based programs and initiatives recognise that communities are often best placed to understand their unique local needs. To do this, they facilitate community participation methods to tackle challenges, including entrenched disadvantage and compounding disasters. Programs such as Stronger Places, Stronger People (Geatches et al. 2023), The Nexus Centre (Geatches et al. 2023) and First Nations community-controlled health care initiatives such as those funded by the Lowitja Institute (2024) highlight a burgeoning national place-based reform agenda. In the same vein, the Paul Ramsay Foundation developed diverse place-based resilience-building programs since the 2019–20 summer bushfires such as Fire to Flourish.[1] Geatches et al. (2023) point out that such approaches are fundamental to self-determination of First Nations peoples and that this way of working has immense potential to reimagine top-down relationships that have historically created barriers for communities with differing needs. Thus, new opportunities arise for community-led approaches.

With many design, participatory and built environment disciplines naturally working in place-based ways, 'placemaking' (Hamdi 2010; Projects for Public Spaces n.d.) and similar 'co-design' (McKercher 2020) methods have emerged with the potential to offer innovative pathways that can shift inflexible structures and models. When melded with creative practice, First Nations leadership and research, place-making offers a compelling tool to activate place-based resilience initiatives.

The Placemaking Clarence Valley program (Monash University 2024), a key piece of action research within Fire to Flourish, put such an approach into practice. It is composed of a local community team, design researchers and a group of architecture and urban planning postgraduate students in a novel collaboration. The program was formed to support a group of communities with diverse resilience ideas, many increasing in need following the 2019–20 bushfires. Over 2023–24, 4 localities situated across Bundjalung, Gumbaynggirr and Yaegl Country

1. Fire to Flourish at www.firetoflourish.monash/.

Placemaking on Yaegl Country (Woombah) in 2023.
Image: Yuk Chun (Amy) Kwong


Figure 1: Map of Bundjalung, Gumbaynggirr and Yaegl Country and the Clarence Valley Local Government Area on the northern New South Wales coastline.

(Figure 1) came together to generate rich ideas for new or upgraded spaces. This included places and concurrent services that worked in concert across multiple modes for everyday social resilience as well as during emergencies. Doing so revealed that placemaking is a highly relational process that activates participatory principles in place-based settings. It supports community resilience planning through a socially engaged process of co-creating ideas for places as well as through built and infrastructural outcomes generated from that process.

The community leaders, creative practitioners and researchers who led the program shared 5 learnings that have emerged from the program. These learnings capture anecdotes and evidence of how creative placemaking enhances resilience. However, what was also revealed was the existing barriers to developing robust opportunities to augment such ways of working within the disaster and resilience sector.

## Discussing 'place' explicitly brings people together

First Nations peoples and communities have known and practised the importance of connection to each other and

 

Country (place) for many generations. This connection has been intrinsically linked to their health, wellbeing, resilience and the ability to prosper. First Nations scholar and educator, Marion Kickett, defined resilience in First Nations communities as:

> *The ability to have a connection and belonging to one's land, family and culture, therefore an identity. Allowing pain and suffering caused from adversities to heal. Having a dreaming, where the past is brought to the present and the present and the past are taken into the future. A strong spirit that confronts and conquers racism and oppression, strengthening the spirit. The ability not just to survive but to thrive in today's dominant culture.* Usher et al. (2021)

Wiradjuri/Ngemba woman, Roxanne Smith, initiated Placemaking Clarence Valley to provide a vehicle that enabled communities of diverse backgrounds to come together, dream of the future and link their lives with the places, spaces and Country they live in.

> *Exploring needs, connection points and access for services, entertainment and culture highlighted those links and in doing so, broke down many barriers. People's resistance to 'dreaming' dissipated and in turn created a series of connection cogs that helped progress and incite action in the dreams that resonated across the community. The creative and visual practices that focused on the community members' places encouraged even the biggest cynics to eventually 'jump in the ring'. They wanted to highlight their knowledge, their connection to their places and share dreams about their Country, they wanted to be engaged! They could see this was about them and a better future for all, it was visual, it was physical, it was connected and heartfelt. It had a purpose!* Smith (2024)

Smith's (2024) observations highlight that people, places, services, systems and Country are interconnected in reciprocal overlapping relationships and resilience can be amplified when groups of people interact and collaborate effectively in a physical context. Although proximity and relationship with physical 'place' are what enable people to self-organise and solve problems in a crisis, we cannot extricate the physical aspects of place from a more complicated and dynamic set of social relationships and practices.

## Time is critical to place-based initiatives

For researchers and practitioners to gain valuable insights, the importance of exploring a locality, meeting people, visiting homes and experiencing 'problems' in real time cannot be overstressed. To truly understand a place, however, can take a lifetime; 'enough' time is always an issue.

People from the 4 localities in this program consistently erred away from using the placemaking program to resolve the consequences of recurrent bushfires or vast systemic problems in their areas. This was likely due to insufficient time and that there wasn't holistic expertise to do so. Rather, people attended with the intention to join a facilitated discussion with fellow community members on how to prepare for a next time, to better help themselves and others, in the context of improving shared places.

To augment this shared understanding and to grapple with the tension of time, the team provided a methodology and creative place-oriented tools to consider next best steps. Specifically, the time barrier was 'hacked' by using long-standing relationships the community leaders and extended teams on the ground already had with local people. These pre-existing, deep levels of trust enabled this novel process to emerge powerfully in each context within a relatively short period of time. Thus, despite many of the postgraduate students not fully grasping the underlying rural mindset, social boundaries and, at times, language, they were able to support in effective ways.

Key contributions included synthesising community-led findings into a collective vision and key action projects housed within strategic placemaking frameworks that galvanised well-informed project proposals derived from each locality. Additionally, creative renderings and spatial drawings of proposed solutions to problems, needs and undeveloped potential of sites fast-tracked thinking during the 14-month period of the program.

Supported by seed funding, the prevailing mood was steady and hopeful that meaningful improvements could be made in due course. Critically, projects were catalysed by various creative tools and outcomes designed to assist with decision-making after the research was over.

## Creative practices transform how resilience is framed

The program experimented with creative, community-led approaches to build disaster resilience. Rather than focusing on ever-present risks and emergency response, processes considered community needs and priorities during the 'good' times too.

Gathering in communal spaces, the team used walking, photography, drawing, mapping with tactile materials, listening to Elders on Country and participating in First Nations-led 'yarning' to involve people from each locality. People were invited to reflect on their locality's social, natural and cultural assets, including built infrastructure. This holistic thinking, combined with placemaking approaches, enabled participants to leverage local knowledge, identify strengths, enhance adaptability to one another's ideas and promote forms of social cohesion that are valuable day-to-day let alone in times of crisis.

Accompanying the hands-on placemaking tools was action research designed to contribute to a growing body of evidence on the high social impact of creative recovery approaches (Creative Recovery Network 2023). Importantly, action research provided tangible resources for involved communities (Monash University 2024). Local data, photos, maps, quotes, results of surveys and ballots were presented in accessible formats within placemaking frameworks. These resources facilitated community and stakeholder engagement with a shelf-life well beyond the program's duration.

## Technical barriers inhibit resilience building: placemaking processes help

Place-based initiatives often rely on technical skills to augment the ways in which community-led insights influence resilience building. From discrete processes such as mapping, transposition of paper-based data, grant writing and digital tasks to technical activities such as developing feasibility studies or concept designs, significant challenges exist for communities to take next steps (Cavaye 2001), even when funding is available. This program experimented with how partnerships can bridge these gaps through knowledge and skills sharing. Leveraging the skills of postgraduate students and practice-based researchers bolstered the involved communities by offering technical inputs that might normally require expensive consultancies. An example was the implementation of online and in-person voting systems for community-led decision-making processes.

Good participation rates were achieved through providing participants with highly visual information along with both digital and paper-based voting platforms. In some instances, participation was 32%. Such outcomes show there is still room to improve participation in community-led decision-making but that nuanced systems coupled with technical support can generate strong insights. Additionally, supporting community development with approaches like 'service learning' (involving students) can disrupt volunteer fatigue and pro bono consultancy arrangements, which can often lead to a deprioritisation of projects due to personal and financial loads on individuals and organisations.

## Successful resilience-building processes depend on 'deep context'

Smith (2012) indicates that data and research are 'dirty words' in many remote and regional communities, particularly those with high populations of First Nations peoples. However, when derived from the ground up and governed in a self-determined way, research can be a powerful asset for local groups to lead their resilience-building initiatives. The program generated various forms of local data that helped groups develop and justify a collective case for change. Discrete research activities were fortified with creatively driven community engagement in parallel with involvement by members of the local council. This meant that diverse touchpoints with the program were available to stakeholders. This also assisted in building momentum towards community-led grants processes culminating in each locality.

An example of how local data informed the research design were the surveys developed and distributed by the leadership team. Surveys were designed in digital and paper formats and were available on social media platforms and at community locations. Surveys used plain language: what were people's places of interest, how could they be improved and what needs to be protected? Responses identified places of interest that informed the research team's site and context analysis and placemaking workshop design.

The survey piqued interest in the research and a total of 127 people attended the workshops. A community exhibition of outcomes from the workshops, coupled with feedback forms, allowed participants to explore the survey findings some months later and to see the visualisations of design possibilities along with ways to offer critique. The culminating community-led granting resulted in nearly 400 votes for a range of project applications across the 4 localities and formed the community-led decisions around what was ultimately granted.

The gradual uptick in engagement confirmed the viability of the projects in terms of community needs. Since various projects required planning approvals from local councils, the aggregated community consensus gave councils the confidence to support projects and to participate in the program. To assist in mobilising projects, the local council offered several rounds of regulatory advice along with waiving planning fees so that projects could hit the ground running.

## Conclusion

The Placemaking Clarence Valley program experimented with how creative and participatory forms of data generation and community-led research can transform into an engaging and reciprocal process. While focused on place and improvements to physical infrastructure, the process enabled a set of social relationships and practices to emerge. Although there were limitations in the scale of participation reach and breadth, reflections on the learnings provide answers for how creative participatory processes can work better, articulated through a set of emerging principles. Beginning with local people, an acknowledgment of the value of spending time in place together is intrinsic to First Nations peoples' wellbeing

 

and develops the critical ingredient of relationality, that ultimately, all can benefit from. Using arts, cultural and creative practices to co-design new infrastructure and services provides opportunities to develop meaningful and ongoing discussions and to share knowledge and collaborate. While gathering evidence and evaluation through robust data is important, co-design and placemaking methodologies demonstrate the adaptable processes that place-based programmes need in order to move away from traditional top-down approaches in not only recovery but research.


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# Social inequalities and vulnerabilities revealed by the flooding event on Cabbage Tree Island in March 2022

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## Abstract

Disasters disproportionately affect marginalised communities, exacerbating pre-existing social inequalities and intensifying vulnerabilities. The March 2022 flooding of Cabbage Tree Island, a predominantly Aboriginal community in northern New South Wales, illustrated how systemic inequities heighten the susceptibility of Indigenous populations to environmental catastrophes. Aboriginal communities are overrepresented in disaster-affected areas and often under-resourced during response and recovery efforts, a reflection of historical and ongoing structural failures. These failures include the exclusion of Indigenous leadership in emergency and disaster planning and the neglect of Indigenous knowledge systems in preparedness, response and recovery strategies.

This paper critically examines the 2022 Cabbage Tree Island flooding event and related literature through the lenses of disaster risk reduction, Indigenous knowledge systems and social justice. The paper advocates for inclusive emergency and disaster management practices that address specific cultural and social needs.

## Introduction

Disasters do not affect all communities equally. The flooding of Cabbage Tree Island in 2022 demonstrated how such events disproportionately affect Indigenous populations, exposing longstanding systemic inequalities. Ismail-Zadeh (2014) introduce the concept of vulnerability amplification, which explains how pre-existing social inequalities (such as poverty, inadequate infrastructure and, limited access to resources) are magnified during emergencies and disasters. For Cabbage Tree Island, the failure to incorporate Indigenous perspectives into disaster risk reduction strategies deepened the community's vulnerabilities.

The 2022 Flood Inquiry report (O'Kane and Fuller 2022) revealed significant shortcomings in the emergency response and noted, that the response was severely under-resourced and ill-prepared to address the needs of vulnerable communities, including those on Cabbage Tree Island. Similarly, the Bundjalung Nation's submission underscored that Aboriginal communities were forced to rely heavily on their resources during the crisis, receiving minimal support from government agencies (Bundjalung 2022). These experiences underscore the systemic neglect Indigenous populations face and highlight the critical need for inclusive emergency and disaster management practices that prioritises local knowledge and Indigenous leadership (Krüger et al. 2015). The exclusion of Indigenous perspectives from disaster risk reduction, as seen in the Cabbage Tree Island floods, runs counter to the United Nations *Sendai Framework for Disaster Risk Reduction 2015-2030* (Sendai Framework), which calls for inclusive governance that incorporates vulnerable and marginalised communities in decision-making processes (UNISDR 2015).

Although the community was relocated to new homes by November 2022 (ABC News 2022), the ongoing flood risks associated with rebuilding in vulnerable areas (ABC News 2023) suggests that long-term recovery efforts have not adequately accounted for the cultural and social contexts of the affected Indigenous populations. By incorporating Indigenous knowledge systems into preparedness and recovery strategies, the community could have addressed the physical damage while strengthening cultural resilience

for long-term recovery (Mercer et al. 2008). However, there is still potential for positive change. Including Indigenous leadership in decision-making would improve management strategies so that they are culturally and socially responsive, leading to more effective outcomes.

Lenkunyar Roberts-Hickling, Chairperson of the Jali Local Aboriginal Land Council, highlighted the systemic failures in preparedness, noting that the community was given only 3 hours' notice to evacuate, which resulted in a rushed and traumatic departure (Roberts-Hickling 2022). This incident exemplifies broader infrastructural deficiencies and the exclusion of Indigenous voices from critical emergency and disaster management decisions. The exclusion of Indigenous perspectives from disaster risk reduction strategies deepened the community's vulnerabilities and underscores the urgent need for more inclusive disaster management practices that respond to cultural contexts (Ismail-Zadeh 2014).

## Literature review

### Indigenous knowledge and disaster resilience

The exclusion of Indigenous voices in emergency and disaster planning was a critical factor in the inadequate response to the 2022 floods. The Bundjalung Nation's submission to the NSW Flood Inquiry detailed how local communities were left without sufficient government support during the crisis, forcing them to rely on their limited resources (Bundjalung 2022). This sentiment is echoed in the Independent Flood Inquiry Report, which highlighted widespread dissatisfaction with the government's slow and poorly coordinated response, further marginalising already vulnerable Aboriginal communities (O'Kane and Fuller 2022).

Indigenous cultural knowledge plays a vital role in building resilience within Indigenous communities. As Janke (2015) argued, safeguarding this knowledge through intellectual property rights and research protocols is essential for sustaining community resilience. As Howitt et al. (2012) argued, the response to natural disasters must be grounded in respect for Indigenous rights and knowledge systems. They assert that the failure to do so not only exacerbates vulnerabilities but also violates the rights of Indigenous peoples to manage their land and resources according to their cultural practices. However, in the case of Cabbage Tree Island, Indigenous knowledge systems related to environmental management and disaster risk reduction were disregarded mainly during the recovery process. As Leck (2023) writes, 'Many members of the community endured weeks of discrimination and increasing isolation. Confusion and uncertainty were met by miscommunication in all aspects of their now displaced lives '.

Similar to the traditional knowledge Indigenous communities use in Australia, local coping strategies have proven effective in flood-prone regions globally. Mathura et al. (2013) highlight how Indigenous knowledge in Zimbabwe was vital for community resilience to floods, paralleling the potential of Indigenous strategies on Cabbage Tree Island. This represents a significant missed opportunity to use cultural wisdom to enhance recovery efforts (Dobbs et al., 2016; Krüger et al. 2015).

The connection between social inequalities and disaster vulnerability shows that marginalised communities often bear the brunt of natural hazards due to pre-existing disparities. In Cabbage Tree Island, excluding Indigenous leadership and knowledge from risk reduction strategies compounded these vulnerabilities and led to a significant loss of potential. By disregarding the expertise embedded in Indigenous practices that could inform resilient recovery measures, mainstream emergency management policies exacerbated the community's susceptibility to harm, delayed recovery and perpetuated cycles of marginalisation and risk.

This underscores the urgent need for a shift in emergency and disaster management strategies to be inclusive of Indigenous knowledge and leadership, which are crucial for creating more effective and equitable responses.

### Collaborative approaches and Indigenous land and water management

Wright et al. (2021) underscore the significance of Indigenous-led environmental management programs, such as ranger initiatives, which promote cultural resilience and community wellbeing by fostering deep connections to the land. These programs have proven effective in enhancing community resilience. Similar principles could have been applied to disaster management on Cabbage Tree Island. By incorporating Indigenous knowledge systems into preparedness and recovery strategies, the community could have addressed the physical damage while strengthening cultural resilience for long-term recovery.

Moggridge et al. (2019) highlight the significant potential for improvement in emergency and disaster management strategies by effectively integrating Aboriginal cultural values into contemporary water planning in New South Wales. Adopting this approach widely could significantly enhance flood management in Indigenous communities and, address ecological and cultural concerns. Sangha et al. (2019) stress the importance of Indigenous land management practices in mitigating the effects of climate change and natural hazards. They argue that Indigenous natural and cultural resource management provides essential ecosystem services and strengthens cultural and community resilience, both critical during recovery. Had disaster recovery efforts on Cabbage Tree Island drawn

on Indigenous cultural and ecological knowledge, the community could have experienced a robust physical and social recovery.

Additionally, Paton (2006) provides a comprehensive framework for disaster resilience, emphasising the importance of community-led initiatives and governance structures. His work underscores the potential for local communities, such as Cabbage Tree Island, to foster resilience and empower themselves. Applying Paton's framework to emergency management on Cabbage Tree Island could have facilitated an effective recovery by centring Indigenous leadership and community-driven approaches. For example, Indigenous ranger programs align with Paton's emphasis on local governance and could have played an instrumental role in fostering a more resilient and sustainable recovery.

## Engaging Indigenous communities

Leck (2023) underscores the importance of culturally sensitive engagement with Indigenous communities in emergency and disaster management. This notion is supported by Mercer et al. (2008), who argued that participatory research fosters community ownership and more effective disaster management.

The connection between social inequalities and disaster vulnerability posits that marginalised communities often bear the brunt of natural hazards due to pre-existing disparities. Climate change further intensifies these vulnerabilities, particularly in health outcomes (Lee at el. 2023). The vulnerabilities faced by Cabbage Tree Island residents are not limited to disaster management; systemic neglect in other areas, such as education, exacerbates the community's challenges. For example, during the COVID-19 pandemic, the Cabbage Tree Island School was overlooked in the distribution of homeschooling technology, leaving students without critical resources (ABC News 2020). This oversight reflects broader infrastructure inequities that hinder the community's ability to recover from crises like the 2022 floods. These inequities (socioeconomic deprivation, insufficient infrastructure and, restricted access to essential resources) amplify the effects of disasters, leaving communities more exposed and less capable of recovering (Tierney 2006; Ismail-Zadeh, 2014).

The Northern Rivers Community Healing Hub in New South Wales, discussed by Atkinson (2022), exemplifies a community-led, Indigenous-informed response to disaster events. This initiative, driven by Indigenous leaders and grounded in cultural healing practices, provided holistic support to affected communities. A similar model could have significantly improved recovery efforts on Cabbage Tree Island, where the exclusion of Indigenous voices exacerbated vulnerabilities. Healing hubs centred on Indigenous perspectives could play a vital role in disaster recovery, addressing material and cultural needs.

## Cultural effects

For Indigenous peoples, land and water are integral to their cultural identity and spirituality. The forced displacement of the Cabbage Tree Island community severed ancestral ties to the land, worsening the trauma of the flood. Kennedy et al. (2022) highlighted how disruptions to cultural and spiritual connections, especially during crises, have profound effects on people of Aboriginal and Torres Strait Islander background. The relocation of the Cabbage Tree Island community similarly compounded the cultural and psychological effects of the disaster (National Indigenous Radio Service, 2023).

The flooding of Cabbage Tree Island deeply affected the material and cultural aspects of the community's life. As Kennedy et al. (2022) noted, disconnection from the land leads to severe psychological and spiritual consequences for Indigenous peoples, for whom the land is core to their identity.

This loss is captured in the song '*Wanna Go Home*' by the Cabbo Crew, an Indigenous group from Cabbage Tree Island (DesertPeaMedia 2023). Released in 2023, the song is an emotional response to the flood and expresses the community's deep yearning to return to their ancestral lands. The song symbolises the broader struggle of Indigenous peoples to preserve their cultural identities amid environmental disasters and marginalisation. It, stresses the importance of social justice and the inclusion of Indigenous voices in recovery efforts. Incorporating cultural expressions like 'Wanna Go Home' into recovery plans can make these efforts more culturally sensitive, supporting physical recovery and emotional and spiritual healing. This holistic approach is critical to address trauma and preserve cultural ties to the land.

The cultural loss amplifies the trauma endured by the community and shows, the need for recovery efforts to go beyond rebuilding homes. Quinn et al. (2022a) argue that disconnection from land has profound spiritual and psychological consequences, as land is inseparable from Indigenous identity. Crooks et al. (2020) assert that Indigenous-led disaster responses enhance resilience, yet these were neglected in the Cabbage Tree Island case.

Rebuilding in an area classified as 'unacceptably high risk' for future flooding (ABC News, 2023) shows the failure to integrate Indigenous knowledge into long-term recovery planning. Including Indigenous voices is crucial for cultural preservation and resilience (Quinn et al., 2022a).

In a significant development following the floods, the Jali Local Aboriginal Land Council voted to rebuild on Cabbage Tree Island, despite its known flood risks. This decision underscores the community's commitment to preserving cultural ties and exercising self-determination. The council's choice reflects Indigenous resilience, a powerful statement of agency that aligns with the principles of 'Caring for

 

Country' (Williamson 2022a). It also serves as an example of culturally responsive disaster management that values Indigenous knowledge in rebuilding efforts, an approach advocated by the Sendai Framework (UNISDR 2015).

## Economic effects

The economic vulnerabilities of the Cabbage Tree Island community were already significant before the flood, and the disaster only exacerbated the challenges. The destruction of land-based livelihoods, such as farming and fishing, left the community in a precarious economic position. While rebuilding efforts have been undertaken, the community remains dependent on external aid, and concerns about the region's sustainability hinder long-term economic recovery (ABC News 2023). The Jali Council's decision to rebuild shows the need for support systems that align with Indigenous priorities for cultural and economic resilience. (ABC News 2024). Quinn et al. (2022b) emphasise that community-led recovery initiatives are essential to foster economic resilience. However, Cabbage Tree Island's future remains uncertain without sustainable long-term planning that incorporates Indigenous perspectives. While external aid provides short-term relief, it fails to address the underlying causes of economic instability, which are critical to long-term recovery (Tierney 2014).

Disasters also have gendered effects, with Chowdhury et al. (2022) noting that Indigenous women, who often play vital roles in maintaining livelihoods and households, are disproportionately affected. These gendered aspects further complicate the economic and social recovery of Cabbage Tree Island. Foote et al. (2023) argued that recognising and supporting Indigenous women's leadership in disaster recovery could significantly bolster economic resilience and help drive sustainable recovery efforts.

## Health and psychological effects

The forced displacement, cultural dislocation and loss of livelihoods caused significant trauma to the Cabbage Tree Island community. Smith (2024) noted that climate-induced displacement often triggers severe mental health challenges, significantly when cultural practices are disrupted and communities are separated from their ancestral lands.

Indigenous communities face specific health challenges after disasters, worsened by the loss of cultural connections. Lee et al. (2023) highlight that climate-related health issues disproportionately effect Indigenous populations, stressing the need to integrate health planning into disaster recovery to address these vulnerabilities.

Wind et al. (2012) argue that marginalised communities experience more significant mental health challenges post-disaster, notably when recovery lacks inclusivity. Strengthening social capital through community cohesion could help alleviate mental health stressors for the Cabbage Tree Island community, promoting psychological recovery.

Women's experiences in disasters present distinct emotional challenges. Chowdhury et al. (2022) emphasised that the trauma of displacement, loss of livelihoods and, cultural ties have deeply affected women on Cabbage Tree Island. Addressing the specific needs of women in recovery is essential for inclusivity (Krüger et al. 2015).

Indigenous health challenges increase when cultural connections erode after disasters. Watego et al. (2021) advocate for an Indigenist Health Humanities approach focusing on Indigenous cultural practices in health. This framework could offer culturally sensitive mental health support for the Cabbage Tree Island community, addressing both trauma and cultural dislocation.

Incorporating trauma-informed public health frameworks is crucial for comprehensive and culturally appropriate recovery efforts. Graham et al. (2022) emphasise that Indigenous communities need frameworks addressing the physical and emotional effects of disaster events. Trauma-informed care, aligned with Indigenous values, can support mental health and long-term recovery for communities (Krüger et al. 2015).

## Social cohesion and community resilience

The 2022 flood exposed the Cabbage Tree Island community's vulnerabilities, including poverty, poor infrastructure and, limited services. Rolfe et al. (2020) note that rural and Indigenous communities in New South Wales face systemic inequalities, making recovery more complex. Social cohesion was severely disrupted by the flood. The displacement fractured the community's social capital that is essential for recovery. While relocating residents provided physical stability (ABC News 2022), rebuilding social cohesion requires restoring the social bonds the disaster broke.

Quinn et al. (2022a) argue that social capital is vital for post-disaster recovery and to foster belonging and inclusivity, especially for marginalised communities. The failure to prioritise Indigenous-led efforts in Cabbage Tree Island hindered social cohesion. An inclusive framework that engages Indigenous leadership, as demonstrated by the Jali Council's rebuilding decision, would strengthen resilience and social cohesion (ABC News 2024; Krüger et al. 2015).

## Conclusion and recommendations

The flooding of Cabbage Tree Island revealed deep-rooted systemic inequalities that continue to marginalise Indigenous communities in Australia. Despite the relocation of residents (ABC News 2022), persistent challenges, including the risk of future flooding (ABC News

2023), highlight the inadequacy of emergency and disaster management strategies. Culturally responsive approaches that leverage Indigenous knowledge and leadership are essential for long-term recovery (Williamson, 2022b; Quinn et al., 2022a, 2022b; Wright et al. 2021). The Jali Council's decision to rebuild on Cabbage Tree Island signals a commitment to Indigenous self-determination and resilience, showing that culturally responsive approaches are essential for long-term recovery (ABC News 2024).

Community-driven recovery practices are necessary to engage marginalised populations (Krüger et al. 2015). The Sendai Framework stresses prioritising vulnerable populations and integrating Indigenous knowledge into resilience and preparedness (UNDRR 2015). The Australian Institute for Disaster Resilience (2022) offers guidelines to incorporate Indigenous leadership into post-disaster recovery and emphasises the need for culturally sensitive, community-led approaches. For Cabbage Tree Island, this means embedding Indigenous voices in disaster planning, addressing physical infrastructure and cultural preservation.

Government agencies must adopt culturally appropriate frameworks to improve recovery outcomes for Indigenous communities, such as the Management Plan for Aboriginal and Torres Strait Islander Populations (Department of Health and Aged Care 2020). This plan emphasises the inclusion of Indigenous leaders and traditional health practices, ensuring recovery addresses physical and psychological resilience.

Critical recommendations to improve recovery:

- Incorporating Elders in emergency and disaster management to bring Indigenous perspectives to planning (Ali et al. 2021). This could prevent future disasters from disproportionately affecting Indigenous communities, as recommended by the Bundjalung Nation (Bundjalung 2022).
- Establishing partnerships between Indigenous communities and the emergency management sector to integrate Indigenous knowledge into risk reduction activities (Ali et al., 2021; Krüger et al. 2015).
- Addressing immediate and long-term resilience, including economic initiatives led by Indigenous communities (Quinn et al. 2022a). Effective recovery must consider cultural, social, and economic dimensions (Ismail-Zadeh 2014).
- Engaging in participatory research with Indigenous leaders to improve disaster planning (Mercer et al., 2008) and address health vulnerabilities related to climate change (Lee et al. 2023).
- Implementing community-led recovery that focus on cultural preservation and provide mental health services tailored to Indigenous peoples' needs (Luk and Longman 2024).

By integrating these recommendations, emergency and disaster management can become inclusive, equitable and effective and address the needs of marginalised Indigenous communities, such as those on Cabbage Tree Island.

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## About the author

**Wade Charles** is an Indigenous researcher at Charles Darwin University. His multi-disciplinary background informs a practice-based approach to disaster research, grounded in frontline service, community engagement and cultural governance. His focus is on strengthening disaster resilience in communities that are often under-represented in formal planning processes. He has a practical and culturally grounded approach that combines experience with a deep respect for Indigenous knowledge systems and governance.

 

# Masculinity takes the stage: power, privilege and culture in disaster resilience

**Dr Emma McNicol**

Monash University



In 2024, the Australian Disaster Resilience Conference hosted a panel discussion on masculinities, culture and disaster resilience. Five men working in the emergency management sector were on the panel facilitated by Dr Emma McNicol. Here are some reflections on the discussions during the session and those that followed.

Understanding the different ways that disasters affect men, women and gender-diverse people is essential for building safety and resilience for future disasters. Yet within disaster discourses, commentary and investigations on men and masculinities has often been limited to describing men's participation in frontline response agencies. As such, the Masculinities, Culture and Disaster Resilience Panel at the 2024 Australian Disaster Resilience Conference asked: 'How does culture influence our understandings of masculinity?' and 'How do varying understandings of masculinities influence our perceptions of, and responses to, disasters?'.

The panellists were John Richardson, Australian Institute for Disaster Resilience, Dr Bhiamie Williamson, National Indigenous Disaster Resilience, Steve O'Malley, Gender and Disaster Australia, Collin Sivalingum, Australian Red Cross and Antony Ruru, Fire and Emergency New Zealand. The discussion explored new ways of thinking about masculinities and natural hazards and how disasters can be a place of transformative opportunities that address entrenched gendered inequality and rigid conceptions of gender.

When asked, 'how have you learnt to become a man?', the men spoke candidly about their upbringings, role models, careers and parenthood. When asked, 'how have you observed gender to operate in the disaster resilience sector?', the men reflected on changing contexts in the sector and how an environment that was once dominated by white men is today becoming more open and inclusive.

The panel discussion was an effort to expand the conversation around the influence of gender in emergency management and sought to explore how gender is a relevant concern for everyone working in the disaster space. Recent research has demonstrated how both during and immediately after a disaster, women are at increased risk of experiencing domestic and family violence.[1,2]

Research has also found that when gender discrimination is not a priority, recovery efforts may reinscribe inequality.[3] These findings are especially urgent in the context of increasingly severe, simultaneous and cascading disaster events.

## Audience reception and interrogating representation

The panel was very well attended and received an abundance of positive feedback. While the panel sought to include a wide range of representatives from different organisations as well as in a range of roles across the sector (including first responders, academics and


Conference attendees heard from panellists Antony Ruru, Fire and Emergency New Zealand, Collin Sivalingum, Australian Red Cross, Steve O'Malley, Gender and Disaster Australia, John Richardson, Australian Institute for Disaster Resilience and Dr Bhiamie Williamson, National Indigenous Disaster Resilience.

Image: AIDR

organisational leaders), audience members shared some concerns about the panel's composition. Some wondered if it was appropriate for an all-male panel to examine masculinity in the sector. One attendee commented that all the panel members were cisgender male, heterosexual and married fathers. In my view, these concerns warrant a thoughtful response and provide a meaningful opportunity for reflection, especially if we are united in wanting an inclusive future for the sector.

At its core, feminist and gender theory maintains that masculinity and femininity entail strict codes of conduct.[4] In a paramilitary context, like the emergency management sector, men are discouraged from expressions of vulnerability.[5] Given this context, the panel was, in my view, especially valuable to allow men in leadership roles to show openness, honesty and (what we might call) 'gender-critical thinking'. Gender-critical thinking is where an individual explores their gender, assessing how they came to be the person they are as well as attempting to evaluate the privileges and/or disadvantages ascribed to them by virtue of their gender. Indeed, several audience members said how unusual and special it was to hear men in this context explore the adequacy of their male role models while growing up, including childhood experiences of violence.

It is important to note that, while the panellists were all cisgender heterosexual husbands and fathers, the panel presented Indigenous and non-Indigenous views on the issue side-by-side in open dialogue. The panel discussions pointed to a bright future for the sector where men can openly and critically discuss their gender identity and in which Indigenous voices are not merely included, but foregrounded. However, there is still work to do to make that future a reality. As such, concerns about the composition of the panel should be taken seriously. Cisgender, heterosexual, married men represent traditional conceptions of masculinity and routinely achieve leadership positions in their professions.[6,7,8] They expect to be listened to, they are listened to, and their intimate confessions are likely to be perceived as more poignant.

Without contribution from men who are not partnered with women and who are not fathers, we miss out on hearing their valuable perspectives. If we want to know

 

what it is like for LGBTQI+ people or those who do not, or cannot, conform to traditional perceptions of masculinity, then a panel like this would need to include a diverse ensemble of men. But there is a deeper conceptual issue at stake here. In my discussion with conference attendees, I sensed that the concerns about the composition of the panel included a wariness that men are unable to fully interrogate masculinity; that, as humans, we struggle to step outside of ourselves and see our privilege with lucidity and humility.

## Are we experts on our(selves)?

Most of us are willing to ascribe people authority in assessing when an aspect of identity has diminished their social power or status, most obviously in instances of discrimination. For example, we would not question a woman's assessment of how her gender plays a role in a job interview or question when a person of colour explains how they encountered racism in a medical setting. It gets trickier when we expect people, or people expect to be able to, evaluate privileged aspects of their identity. Perhaps we can all agree on the fact that (cisgender, heterosexual) men can expound on masculinity. Men themselves are in the best position to explore what it is like to be a man and to reflect on their understanding of the gendered expectations and pressures they confront and negotiate. Surely, we can learn a great deal on the experience of men in the sector from talking with men in the sector.

The question remains whether men alone can comprehensively and critically explore their own masculinity. They are unlikely to be experts on how they are perceived as men, specifically how their male identity intersects with broader structures of privilege and power. If we accept men as reliable narrators of 'being men' and the codes and pressures they have felt as men, this does not make them experts in the way that their 'masculinity' is perceived by others (by women and by gender-diverse people) and how their masculinity can afford them power over others. We can all be experts on our own lives, but this does not make us experts on our privilege nor how we are perceived.

The aspects of identity that lend us social power are not only likely to blind us to privilege but there is reputable research in neuroscience that demonstrates that power can diminish our empathetic capacity to see things from the less powerful individual's perspective.[9,10] None of this is to say that events like this panel should not be run in the future or even that all-male panels should not explore masculinity. Conversely, it might do the opposite.

If we want to hear about what it is like to work alongside men in the sector we can best hear it from panels of women and gender-diverse people. If we want to hear about colonial racism in the sector we should assemble a panel of First Nations peoples. But there is something important about a moment in which the (so-called) powerful party stands up and tries to self-examine their privilege.

The willingness of the panel members to authentically discuss their understanding of masculinity and the inclusion of Indigenous perspectives on the issue was a valuable contribution in a sector that has typically closed down men's opportunities to be vulnerable and to reflect on assumed gender roles. We should think about the success of panels like this not just in terms of what the panellists say but in terms of the ongoing dialogue it generates. Men cannot have the final word on masculinity any more than white people can have the final word on race. The discussion that such events generates, where individuals from different cultural backgrounds can interrogate their own blind spots, is where genuine inclusivity is forged.

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# Building community resilience through the multi-disciplinary research of Australia's leading early career researchers

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Queensland University of Technology



Each year, the Australian Research Council funds up to 200 Discovery Early Career Research Awards (DECRA) to support excellent and innovative research that addresses a significant problem or gap in knowledge and that benefits Australia.

When the 2024 cohort came together in March 2024 for an induction event, it became clear that enhancing community resilience through multiple disciplines and approaches was a common theme across the projects. Community resilience has been defined by Koliou et al. (2020)[1] and Patel et al. (2017)[2]. Here, we conceptualise climate and disaster community resilience as having 4 components that the collective DECRA projects contribute to (following Graveline and Germain 2022)[3]:

- **Reducing impact and consequences:** Research that will help communities, industries or systems reduce vulnerabilities and build capacity and resilience to be better prepared when disasters hit, and therefore reduce effects on people's lives, the economy and society.
- **Reducing recovery and renewal time:** Research that will assist communities to respond and recover quickly and effectively. Recovery may include returning to prior or a new state (bouncing back/bouncing forward). This can include research to improve services available to populations during and after disasters.
- **Reducing future hazards and vulnerability:** Research that examines/draws on past events and associated learning to inform adaptation or mitigation efforts to reduce future vulnerabilities.
- **Reducing future uncertainties:** Research that generates new knowledge so systems can adapt/change in the absence of impact; research that supports proactive adaptation to change. This can include new climate models.

## The contribution of DECRA24

From 200 DECRA fellows in the 2024 round (DECRA24), 26 reported that their research contributed to community resilience. The projects are multi-disciplinary and cover research fields of human geography, urban and regional planning, architecture, social work, civil and chemical engineering, health services, computational and evolutionary biology, ecology, oceanography, biogeochemistry and more. Koliou et al. (2020) comment on the increased scope of community resilience studies, which now include topics across a diverse range of vulnerabilities. In line with this, 14 of the 26 DECRA24 projects (54%) contribute to more than one component of resilience. While acknowledging these cross-cutting contributions, each DECRA fellow allocated their project to one of the 4 mentioned categories. The contributions of the 26 projects to community resilience are summarised in Figure 1.

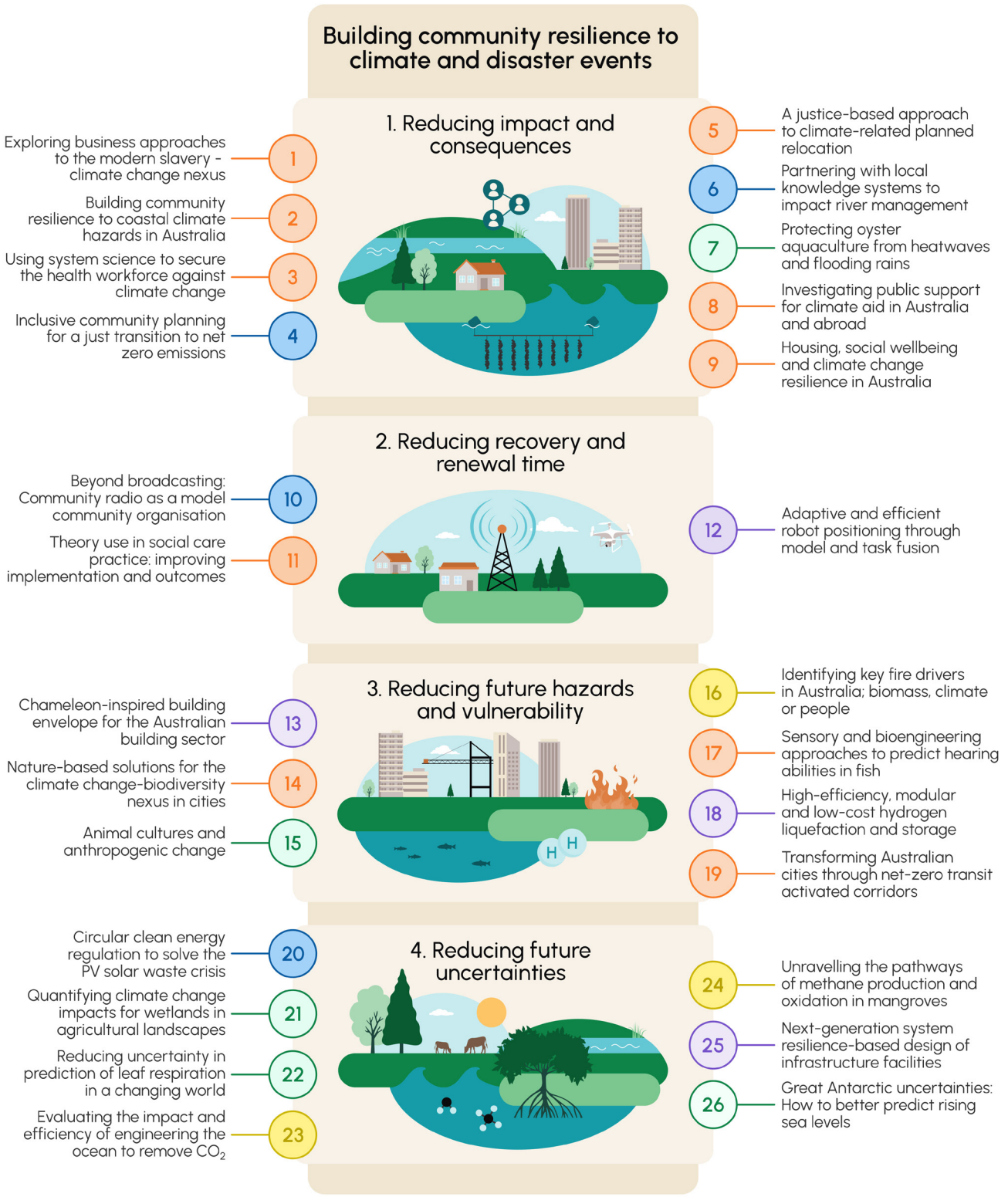


Figure 1: Contributions of the 26 projects to community resilience.

## A commitment to collaboration

Category 1 projects explore community resilience, health care demands during crisis, sustainable transitions and public support for socially minded adaptation policies. A justice-centred approach is common.

Category 2 projects reduce recovery and renewal time following disturbance by better understanding the strategies that support preparation and recovery. This includes improved impact assessment, communication and service provision in affected communities.

Category 3 projects develop new knowledge to inform technological improvements in infrastructure, build ecosystem resilience and address climate effects in combination with other significant social and ecological issues.

Category 4 projects reduce risk via approaches and technologies that better predict and manage greenhouse gas emissions and the effects of climate change (e.g. sea-level rise) while improving the sustainability of the new and existing technologies.

Trans-disciplinary research is critical to bring an holistic approach to the complex socio-ecological inter-relationships that shape community resilience in Australia and beyond. The 26 DECRA24 projects cover 22 disciplines and contribute new knowledge across 4 categories of community resilience. This bodes well for the development and generation of knowledge to address the various yet interconnected aspects of community resilience. The DECRA24 cohort fosters ongoing engagement throughout research projects. This collaborative approach allows new knowledge to be shared, future collaborations to be built and gaps in our understanding to be identified that can ultimately strengthen resilience in communities.

This summary is based on an article authored by the DECRA24 Community Resilience Consortium. See www.usc.edu.au/coastalresilience/DECRA24Consortium.

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We acknowledge the Traditional Owners of country throughout Australia and their continuing connection to land, culture and community. We pay our respects to the Elders past and present. This research is supported by the Australian Government through the Discovery Projects funding scheme. The views expressed are those of the authors and are not necessarily those of the Australian Government or the Australian Research Council.

## Endnotes

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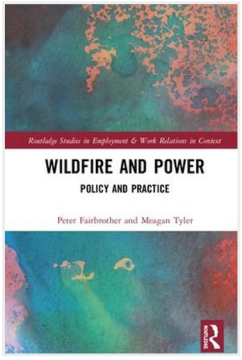
# Wildfire and Power: Policy and Practice

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This thoughtful and thorough book examines wildfire disasters as social events that are interconnected, multifaceted, immensely consequential yet also disjointed and divisive. The authors draw on perspectives from a variety of fields such as sociology, political science, gender studies and history, which they use to interpret and understand the juncture of Australian policy and preparedness for wildfire (i.e. bushfire, grass and forest fires) in novel ways.

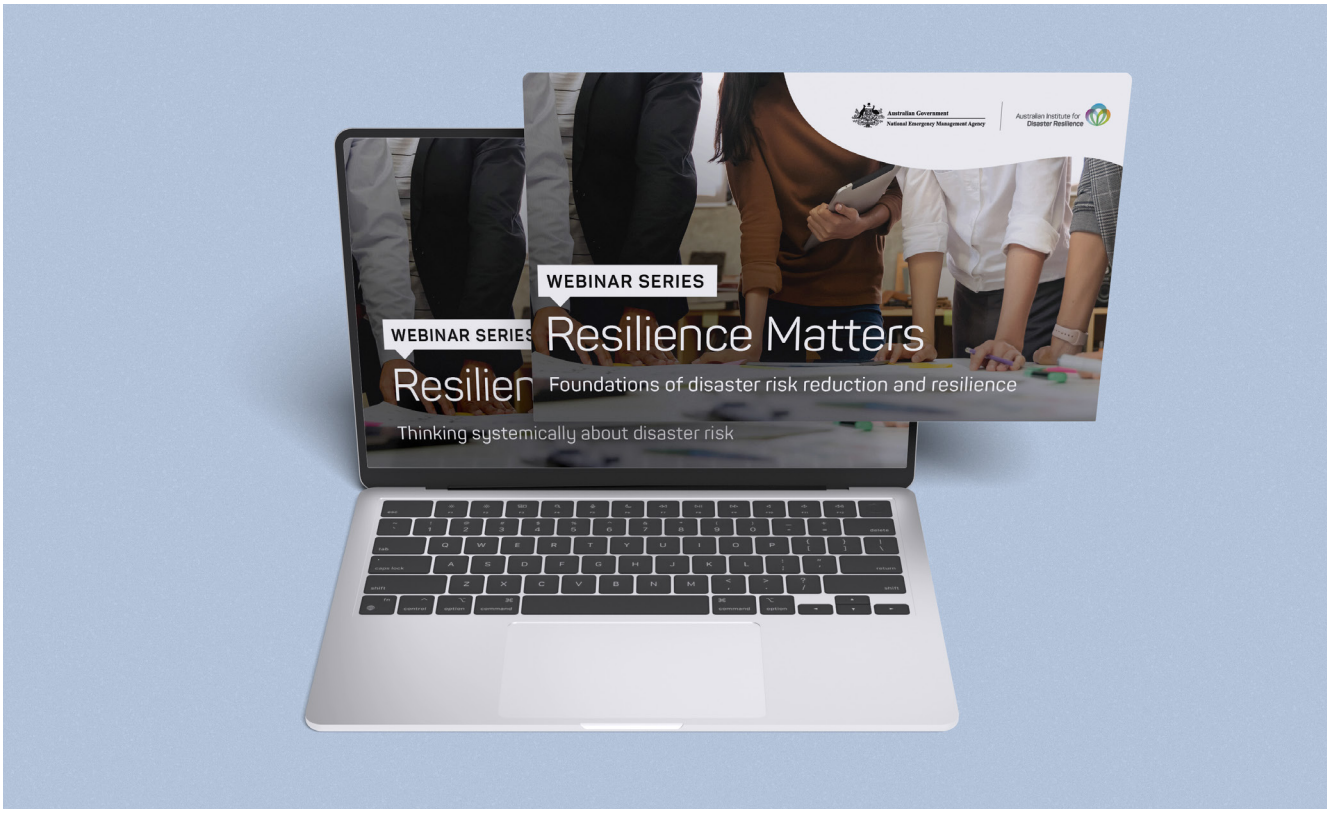
A major strength of this work is that it is grounded in a significant body of research that involved more than 200 interviews in 12 different locations over 3 years (2010–13 in the aftermath of the 2009 Black Saturday bushfires). Interviewees included people from rural and urban-rural areas, sea- and tree-changers, as well as emergency service responders, both staff and volunteers. The authors succeeded in translating academic research in a readily understood piece of work. It is, however, still a book that needs to be read in several sittings. The information and insights the authors share in eloquent ways are comprehensive and thought-provoking. To understand these at a deeper level, one needs to take the time to reflect and consider.

The book brings about a better understanding about the intersection between community, institutions, government and response agencies, particularly around issues of power and inequality, community as a construct and the relationship between people and government. It provides an academically contextualised discussion about the role of community awareness and resilience in bushfire-affected areas. The authors rightly highlight that achieving preparedness is a complex process and that the main problem for government is determining the best and most genuine way agencies can communicate effectively with community members.

Some other messages are that communities are not just localities and that there are contextual nuances such as cohesiveness and disunity that need to be considered. Policy makers must understand how power relations affect social groupings and the agency these groups can exercise before, during and after events. It is not only the social context that matters, but the political plays a huge role as well. Power relationships are brought to the fore during disasters, but these insights can quickly be sidelined or forgotten in the aftermath. This also plays out at the household level. The effects and challenges related to gender dynamics within households are often not well understood nor recognised.

This book is relevant to people working in emergency management, in particular policy makers, practitioners and researchers. It is be pertinent to those who want to understand more about the dynamics of power and diversity and equality, the role of communities in dealing with fires and the challenges of gender and household decision-making when it comes to disasters.

# Resilience Matters webinar series




The Australian Institute for Disaster Resilience (AIDR) is proud to launch its new webinar series, Resilience Matters.

This free, online series will focus on systems, environments and human factors that intersect to influence the varying levels of risk, harm and equity that people experience before, during and after a disaster.

Presenters from a variety of research, government and community backgrounds will be invited to provide their insights and perspectives as we seek to understand how we can reduce harm in these systems to reduce disaster risk and build resilience.

Throughout the series, each webinar will build on these foundational concepts. Everyone is welcome, whether you are an experienced practitioner or are new to these concepts, or somewhere in between.

Australian Institute for Disaster Resilience

### Webinar 1

### Foundations of disaster risk reduction and resilience

Guest speaker: David Sanderson, Inaugural Judith Neilson Professor of Architecture University of NSW.

### Webinar 2

### Thinking systemically about disaster risk

Guest speakers: Professor Lauren Rickards, Director of the La Trobe Climate Change Adaptation Lab and Dr Neville Ellis, Manager of the Climate Adaptation Program.

Explore the series on the Australian Disaster Resilience Knowledge Hub: https://knowledge.aidr.org.au/resources/resilience-matters.

Look out for new webinars as they are developed and added to the AIDR events calendar: www.aidr.org.au/events.







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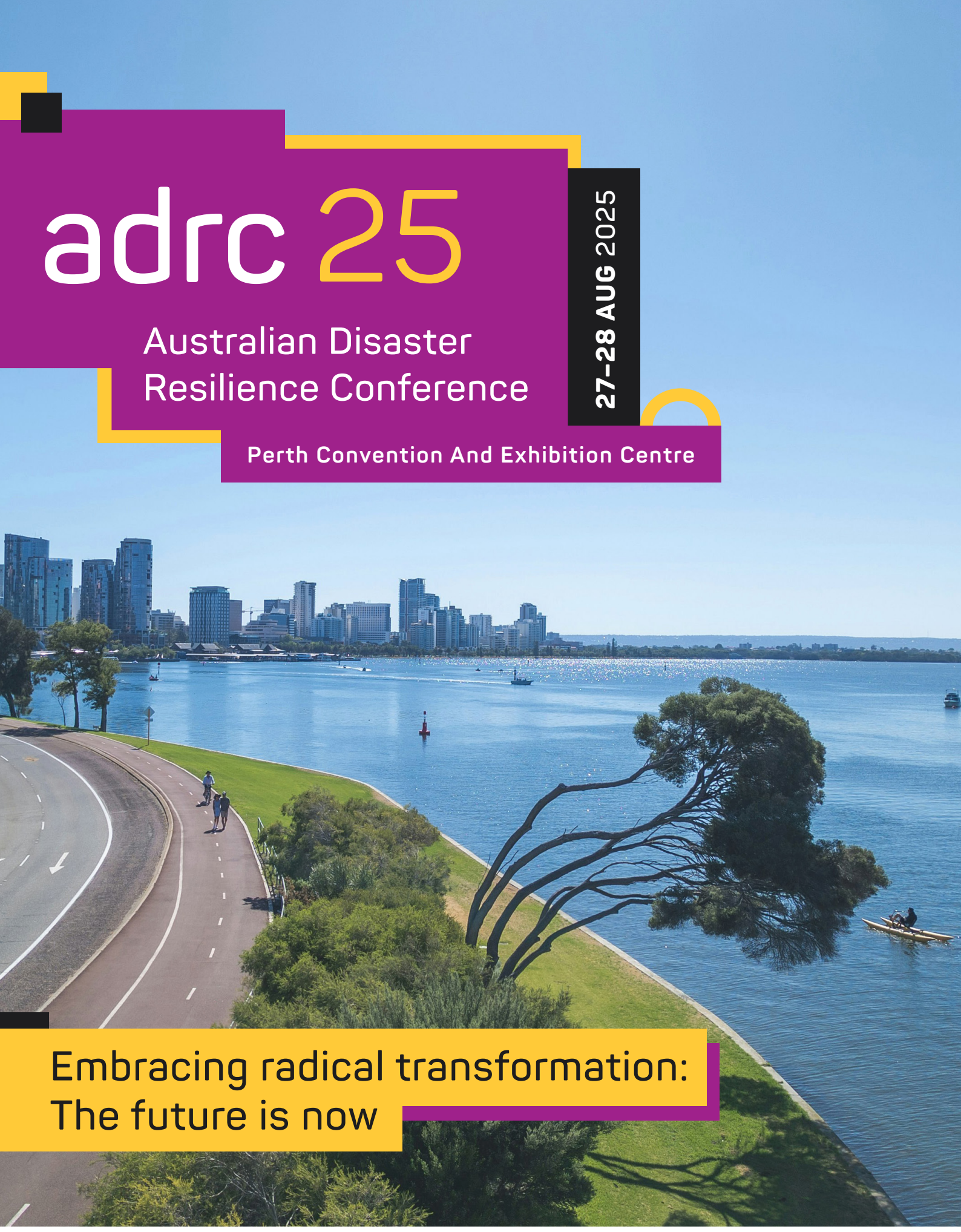

# Embracing radical transformation: The future is now

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