

# Progress Report

30 January 2023



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# Introduction

Natural Hazards Research Australia (The Centre) is Australia's research and implementation centre for natural hazards resilience and disaster risk reduction. The Centre began on 1 July 2021 and is now working closely with the Australian Government and other partners across Australia to deliver a strategic research agenda for the nation.

The Centre is built on the strong foundations of its predecessor Co-operative Research Centres, the Bushfire CRC and the Bushfire and Natural Hazards CRC.

## **The Centre's vision:**

that communities will be safer, more resilient and sustainable in the face of natural hazards

## **The Centre's mission:**

to work with partners and the community on research that is useful, actionable and supportive of better decision-making to save lives and protect communities

The Centre is focussed on undertaking research that promotes natural hazard resilience and reduces disaster risk, to support the needs of a variety of critical stakeholders – including emergency service agencies and communities – in mitigating impacts of, responding to and recovering from disasters caused by natural hazards.

The Centre is both a leader and a catalyst for expansion of natural hazards research in Australia; ensuring that research is informing national and regional policy and capability and improving public safety.

This report covers the period 1 July to 31 December 2022.

## Key achievements

- Board approval of additional projects
- Inaugural Natural Hazards Research forum – October 2023
- Innovation through Disaster Challenge
- Influence on policy decisions
- Expansion of networks
- Growth in partnerships and research links
- Establishment of International Research Advisory Panel
- Establishment of End User Advisory Panel

## Key upcoming activities

- Further research investment rounds
- Biennial Research Plan 2023-25 refresh
- "Big thinking" workshops on future policy and capability
- Natural Hazard Research Forum – May 2023

# Project outcomes

Natural Hazards Research Australia continues to develop a research program to meet its mission. As the Centre's research matures, a strategic and targeted effort will ensure that the outputs are useful, useable and used.

During the initial start-up phase, the Centre has made early progress in achieving outcomes of:

## **Multi-disciplinary research that translates into action**

- Opening four rounds of research, which included two calls for concepts by end-users. A full list of projects including a summary of intended outcomes is provided at Attachment 1. The Centre adopts an end-user driven approach to its research investment to maximise its relevance to research problems faced by end-users. The process for involving end users in submitting project concepts is shown in Attachment 2. The process is key to meeting the grant objective of ensuring the activities of the Centre engage and respond to the needs of stakeholders.
- Signing 23 end user partners. Over the first six months of 2022/23 AFAC has joined as a Partner. Discussions are occurring to on-board further partners.
- 28 research organisations engaged with research projects.
- To derive impact, the Centre continues to build on the Bushfire and Natural Hazard CRC's research, network and capabilities.
- Some examples of initial actions arising from the Centre's research activities include:
  - The Disaster Challenge achieved its goal of unearthing innovation in early career research. The winning team developed the concept of using wi-fi portals to engage with communities on natural hazard risks. The Centre is now working with the team to trial this technology. If successful, opportunities will be sought to scale it to other parts of Australia.
  - Co-investment with the Victorian Environment Protection Authority and State Emergency Service in the testing of floodwater and sediment samples in the 2022 Victorian floods. The investment encouraged the EPA to expand its research across the state and connect with the SES. This research is now being used to educate the community about the contamination of floodwater and potential flood risks. It has also assisted in keeping emergency service volunteers safe.
  - Continued support of the Australian Disaster Resilience Index that was developed in the Bushfire and Natural Hazards CRC. The Index is used by a wide range of end-users including fire and emergency services, land management, local government, NGOs and community organisations and private industry. For example, a land use planning firm recently signed an agreement with the Centre to incorporate data from the Index into its resilience work.
  - Co-investment with Resilience NSW to action outcomes arising from the Bushfire and Natural Hazards CRC research into planning and capability requirements for catastrophic disasters. This work has led to NSW developing a set of capability targets for its emergency management sector.
  - Provision of continuing support to enable the Australian Flammability Monitoring System, based out of the Australian National University, to remain active.



- Working with partners on the *Transformative Scenarios in a Climate-challenged World* resources. These resources outline four transformative scenarios to guide discussions, strategic thinking and future planning. They also highlight the driving forces that interact to shape the future in unpredictable and volatile ways. Developed as a CRC research project in conjunction with the AFAC Climate Change group and rolled out in a workshop format, the Centre is now working with the Australia Institute for Disaster Resilience on further the initiative.
- Continues the CRC-initiated collaboration between researchers and emergency services agencies, as well as key partners and focus groups – such as the Australasian Fire and Emergency Service Authorities Council Workforce Management Group – to imagine what a future workforce might look like. This has opened opportunities for knowledge transfer workshops and guides, as well as further research, into areas such as volunteering, mental health, diversity and inclusion, and teamwork.



- Implementation of a workforce focussed SES Fit for Task project that has sought input from volunteers across Australia of all ages and fitness levels to participate in research to understand the minimum physical requirements that a volunteer will need, to safely undertake SES tasks for which they are appropriately trained and qualified. Endorsed by the AFAC SES Operations Group, the standards for fitness for task for key capabilities will be rolled out nationally over the next two years, including training sessions. Ultimately this will enhance SES capability and safety, by ensuring that volunteers are safe to perform their roles.

- Publication of the report – *Understanding the Black Summer bushfires through research: a summary of key findings from the Bushfire and Natural Hazards CRC* – which presents a summary of findings from 23 projects within four multi-discipline research themes, covering knowledge gaps that arose from Black Summer: fire predictive services, cultural land management, community-centred disaster risk reduction, and bushfire data and reconstruction. The report presents an integrated view of the way forward from the fires, including what new capabilities can be implemented and how Australia can best learn from this extreme fire season. The findings can now be used as a scientific basis by governments, fire and emergency management agencies, industry and community organisations to influence decisions and create safer communities and landscapes in the face of future bushfires. A series of reports and workshops planned for early 2023.
- Utilisation of the Bushfire and Natural Hazards CRC Flood Risk Communication project which has delivered a nationally agreed set of public flood risk messages, informed by research and agreed by a national working group comprising SES representatives from all Australian states and territories. Specifically, 26 unique Community Service Announcements (CSAs) of 30-60 seconds were used by ABC Emergency, about flood risk, desired behaviours, calls to action and sources of help. These CSAs are typically used in radio broadcasts during or in the lead up to, significant flood or storm events around Australia. Here is an example, incorporating research findings:

*It's dangerous to drive on flooded roads, causeways, and rural tracks. Driving into floodwater is the main cause of death in floods.*

*Researchers say many people who drive through floodwater claim to have done it after 'carefully considering the situation.'*

*Consider this. Water over the road can hide deep potholes or roads that are completely washed away. Even if you know the road well, or you're nearly home, it doesn't make the decision to drive through floodwater any safer.*

*Back it up and find a safe way to avoid floodwater.'*

**Research outcomes that ensure our communities have improved capability to prepare for, respond to, and recovery from future natural disasters.**

- Significant early progress has been made on the way to achieving this outcome. For example, the Centre has partnered with end users to undertake post flood research in Queensland, New South Wales, Victoria and Tasmania. This research, due to be completed in 2023, will assist agencies to improve community engagement and emergency planning to enhance community preparedness, response and recovery.
- Communication of vast and growing knowledge on natural hazards risks directly to communities through the media, multiple social media channels, monthly newsletter, website, and other communications channels. The Centre has been heavily engaged with the media over the last six months on flood related research which includes issues around community education and warnings, climate and weather, resource allocation across jurisdictions, workforce stressors, insurance, and infrastructure. Centre events also attracted engagement with the community, such as these social media posts from 2022:

Post Content	Total Engagements	Reactions	Comments	Shares	Post Clicks (All)
<p>What an exciting night of finalist pitches for the #DisasterChallenge Final! The first pitch was an amazing demonstration of...</p> 	507	190	60	6	—
<p>There's been more great engagement and knowledge sharing at United Nations Office for Disaster Risk Reduction (UNDRR)'s Asi...</p> 	337	54	2	1	280
<p>Thank you to everyone who came to our inaugural Natural Hazards Research Forum in Brisbane, which wrapped up this...</p> 	312	59	7	0	246

**Greater collaboration between researcher, government and the emergency management sector to support the needs of communities across Australia.**

- Running a series of engagement activities. For example, the Centre completed its first research forum in October 2023. The forum was attended by around 300 delegates representing 120 different organisations drawn from researchers, fire and emergency services, industry and government. The forum has assisted to strengthen ties across Australia’s emergency management sector and the Australian research community. The forum coincided with the International Day for Disaster Risk Reduction and to acknowledge this an address by a UN representative was provided. The next forum is planned for May 2023, in what is planned to be an annual event. Forum participants were surveyed and provided constructive and supportive comments, including these on what they liked:
  - *“These forums are essential for the success of the NHRA to enable ongoing dialogue between researchers and end-users as well as ensuring that key issues and research areas are seen in the system as a whole and not in isolation.”*
  - *“The quality of the speakers. The time allowed for presenters to provide more in-depth presentations.”*
  - *“This was the most holistic and meaningful inclusion of First Nations people I have experienced at a conference.”*
- Production of short, timely online videos to promote the importance of science to coincide with broader public awareness activities. In 2022 this included National Water Week and World Tsunami Awareness Day. Similar videos were made for Centre events and research. All were posted on social media and accessible on the Centre’s You Tube page.



- Representation on numerous research and end-user related Committees and working groups that assist to bridge the gap between research and practice and catalyse future opportunities.
- Continuation of the CRCs practice of fostering partnerships and networks around Australia, to promote research and utilisation at industry conferences.



### Research results relevant to government priorities

- Active support of the objectives of the National Disaster Risk Reduction Framework and the recommendations of the 2020 Royal Commission Into National Natural Disaster Arrangements. For example:
  - Funding post-flood research to evaluate the implementation of the Australian Warning System
  - Funding research to evaluate the effectiveness of aircraft for firefighting
  - Participating as a member of the Australian Fire Danger Rating System Working Group
  - Funding research to investigate the effectiveness of natural hazards mitigation, including the Queensland Government's Resilient Homes initiative.
- Continuation of a two-decade practise of building Australia's natural hazard research capability through its postgraduate scholarship programs. There are now 29 post-graduate students and 12 associate students, to add to the more than 200 students supported under the CRC program who continue to be engagement in the Centre's alumni activities. The first day of the 2022 Natural Hazards Research Forum was a dedicated professional development session involving a selection of current and past students:



- The first Early Career Research Fellow, Dr Phillipa McCormack, from the University of Adelaide, progressed her fellowship and summarised how she benefited from the program as a opportunity to build networks, present at two international conferences, and submit to academic journals:

*'My proposal was ambitious, but with support from the lovely folks at the Centre and my expanding network of wonderful colleagues, I am arriving at the end of the year with some fantastic research 'wins' under my belt.'*



- The Inquiries and Reviews database contains a catalogue of more than 300 inquiries and reviews relating to emergency management and natural hazards across all jurisdictions in Australia from 1886. A product of a CRC project the database is supported, updated and promoted by the Centre and used by government, the emergency management sector, research and educational institutions and private industry to:
  - compare equivalent recommendations between inquiries, themes and jurisdictions
  - track inquiries across jurisdiction, year and types
  - download and work with all inquiries and listed recommendations for the particular needs of your organisation.
- Continued engagement with end-users to ensure that research is relevant to priority areas. This is achieved through end-user partners submitting concepts for funding and via consultation in the development of the Centre's Biennial Research Plan. A series of consultations are planned with end-users and subject matter experts in the coming months to draft the Biennial Research Plan for 2023-2025.

# Project expenditure

**Eligible expenditure in this reporting period**

\$2,826,877

**Estimated eligible expenditure for the next reporting period**

\$7,002,123

**Estimated eligible expenditure for remaining reporting periods in current financial year (if applicable)**

N/A

**Estimated total eligible expenditure for future financial years?**

\$71,575,076

**What is the estimated total eligible expenditure for the project?**

\$85,000,000

**Briefly explain the reason for any changes between the forecast and actual expenditure for the current reporting period, and any significant changes to the forecast budget for the remainder of the project.**

- It became apparent as the development of the Centre progressed that additional tasks needed to be taken on internally. This resulted in changes to the proposed heads of expenditure allocations from those in the original application.
- It is anticipated research expenditure will increase materially in future reporting periods as the research program advances.
- A Deed of Variation is being prepared and will be submitted to the Commonwealth that reflects this intent.
- The total eligible expenditure for the project remains unchanged.

**Is the project expenditure broadly in line with the activity budget in the grant agreement? If no, explain the reasons.**

Yes, but noting the points above.

# Project funding

**Provide details of all contributions to your project other than the grant. This includes your own contributions as well as any contributions from government (except this grant), project partners or others.**

- \$2,839,350 received from Participants as part of annual contributions.
- \$327,184 received as contract research from various contracts.
- \$202,981 received Miscellaneous Income (interest).

Below is the breakdown of expenditure to date based on the heads of expenditure:

Head of expenditure	Breakdown of expenditure	Agreed project cost	Actual YTD
Project expenditure	Labour	\$753,000	\$926,534
Project expenditure	Labour on-costs (30% of labour costs)	\$226,000	\$211,593
Project expenditure	Other eligible expenditure	\$6,866,000	\$1,551,232
Project expenditure	Plant and equipment	\$0	\$0
Project expenditure	Travel and overseas	\$155,000	\$137,518
Financial year total		\$8,000,000	\$2,826,877

**Is the overall project proceeding in line with your research plan**

Yes, the overall project is consistent with the Centre's 10-Year Research Strategy

# Project Progress

Milestone	Agreed end date	Actual/ anticipated end date	Current % complete	Progress comments – work undertaken and impact of any delay
<b>Biennial Research Plan 2023-25 Approved by the Centre Board</b>	30-Jun-23	30-Jun-23	20%	An environmental scan has been completed and presented to the Research and Implementation Committee. The development of the plan will progress in consultation with end-users and subject matter experts over quarters 3 and 4.
<b>All funded research complying with the Centre's research data framework</b>	Ongoing	Ongoing	100%	Provisions included in all relevant Centre project contracts
<b>Outcomes, findings and insights from all completed QDRP projects shared in a timely manner</b>	Ongoing	Ongoing	-	No project grants have been applied for.
<b>Online data catalogue available online (searchable)</b>	30-Jun-23	31-October-23	10%	This project is being developed to pilot a data exchange model with the intention of subsequently using this model in all NHRA data cataloguing projects.
<b>Representation on relevant committees or working groups for relevant end-user research initiatives</b>	Ongoing	Ongoing	100%	The Centre continues representation on: <ul style="list-style-type: none"> <li>→ AFAC Research Committee</li> <li>→ Relevant AFAC Collaboration Committees</li> <li>→ Resilience Valuation Initiative</li> <li>→ NSW Treasury Cost Benefit Working Group</li> <li>→ NSW Independent Planning Commission Technical Advisory Group</li> <li>→ NSW Chief Scientist Advisory Group</li> <li>→ Australian Journal of Emergency Management Editorial Advisory Board and Editorial Committee</li> <li>→ Program Committee AFAC Lessons Management Forum</li> <li>→ Conference Committee Emergency Media and Public Affairs conference</li> <li>→ WA Interagency Bushfire Operations Committee Research Subcommittee</li> <li>→ Industry Advisory Committee for Master of Disaster, Design and Development at RMIT</li> <li>→ Advisory Panel for the Victorian Office of Bushfire Risk Management</li> <li>→ Qld Bushfire and Biodiversity Consortium – State Steering Committee</li> <li>→ Qld Bushfire and Biodiversity Consortium – Fire Science Reference Group</li> <li>→ Qld Disaster Management Research Advisory Panel</li> <li>→ ANZ Disaster and Emergency Management Conference Committee</li> <li>→ Australian Academy of Science National Committee for Information and Communication Sciences (NCICS)</li> <li>→ Australasian Journal of Information Systems (Section Editor)</li> <li>→ Information Technology and People (International Journal – Senior Editor)</li> <li>→ International Journal of Information Management (Distinguished Editorial Board Member)</li> <li>→ International Association of Wildland Fire Committee Members</li> </ul>
<b>Participation of university research collectives and initiatives in Centre activities</b>	30-Jun-23	30-Jun-23	100%	<ul style="list-style-type: none"> <li>→ NHRA sits as an observer on the Queensland Disaster and Resilience Institute Program Board Meeting.</li> <li>→ Key members of Queensland Disaster Research Alliance attended the Natural Hazards Research Forum in October 2022. A key member is represented on the NHRA Education and Training Committee.</li> <li>→ NSW Government will launch the NSW Bushfire and Natural Hazards Research Centre in January 2023. NHRA is establishing collaborative dialogue with the new Centre.</li> </ul>

Milestone	Agreed end date	Actual/ anticipated end date	Current % complete	Progress comments – work undertaken and impact of any delay
<b>October research project investment round complete and approved by the Centre’s board</b>	31-Dec-22	31-Dec-22	100%	<p>October research round completed. 23 project concepts were submitted. The following the new projects were approved by the NHRA Board:</p> <ul style="list-style-type: none"> <li>→ Identifying and defining landscape dryness thresholds for fire</li> <li>→ Capturing uncertainty in bushfire spread prediction using Bayesian modelling and real bushfire observations</li> <li>→ Long-range flood outlook for strategic preparedness</li> <li>→ Healing Country Through Wolgalu/Wiradjuri led Land Management and scoping and operationalisation of Aboriginal Land Management at a landscape wide scale</li> <li>→ Why fly? How do we know that aerial operations are effective and efficient</li> <li>→ Incentivising resilient reconstruction: Evaluating the role of the Resilient Homes fund in enhancing physical and financial resilience following 2022 floods</li> <li>→ Developing an integrated predictive capability for extreme rainfall and inundation</li> <li>→ Safety of alternative and renewable energy technologies</li> <li>→ National Volunteer Sustainability Blueprint for Emergency Management</li> </ul>
<b>April research project investment round complete and approved by the Centre’s Board</b>	30-Jun-23	30-Jun-23	20%	Call for concepts to be announced in March 2023.
<b>Endorsement of the cumulative distribution of project investment across the research portfolio by the Centre’s board</b>	30-Jun-23	30-Jun-23	50%	The Board reviewed the distribution of projects in December 2022. This is a regular feature of discussion at Research and Implementation Committee and Board meetings.
<b>All projects approved for development before 30 June 2022 contracted and initiated</b>	31-Dec-22	30-Apr-23	70%	Work is still being completed to contract projects approved before 30 June 2022. Further additional resources have been allocated and process efficiencies have been identified. Delays are being experienced as research providers negotiate contract terms once being awarded projects.
<b>Annual review of project portfolio by Research and Implementation Committee</b>	30-Jun-23	30-Jun-23	50%	The project portfolio is presented at each Research and Implementation Committee meeting.
<b>Monitoring and reporting capability functional in the project management system</b>	30-Jun-23	30-Jun-23	80%	In progress. Aspects of this have been built including a project page that captures project details, project plan, who the key stakeholders are, financial data and milestones. These can now be monitored for each project. All Tranche 1 to Tranche 4 projects have been uploaded and are being monitored on Turnkey. The next step is to trial quarterly reporting through TurnKey in quarter 3.
<b>Monitoring, evaluation and reporting on progress for research projects implemented in reporting to Research and Implementation Committee</b>	30-Jun-23	30-Jun-23	80%	Regular monitoring, evaluation and reporting on progress for research projects implemented in reporting to Research and Implementation Committee. Broader research monitoring and evaluation framework in development.
<b>Number of post-graduate research students receiving scholarships (30)</b>	30-Jun-23	30-Jun-23	95%	29 active post-graduate students are receiving student scholarships. In addition, the Centre has 12 associate students. See Attachment 3 for more details of these.
<b>ECR Fellowships awarded (2)</b>	30-Jun-23	30-Jun-23	100%	3 ECR Fellowships have been awarded.

Milestone	Agreed end date	Actual/ anticipated end date	Current % complete	Progress comments – work undertaken and impact of any delay
Disaster challenges held per year (2)	30-Jun-23	30-Jun-23	60%	First Challenge successfully completed in October 2022. Planning is currently underway for the 2023 Challenge. A 2023 Working Group has been established and the Challenge question is being selected. The Challenge will launch in late February/early March. The first round will be held over Semester 1, closing in June with finalists selected by 30 June. The finalists will work with mentors across Semester 2 with the final Challenge event to be held on the International Day of Disaster Risk Reduction in October.
First work placement achieved	30-Jun-23	30-Jun-23	5%	Work placement program is currently under design
Research translation workshop held	30-Jun-23	30 Jun-23	10%	Planning underway
International research conference held	30-Jun-23	30-Jun-23	60%	Our first Natural Hazards Research Forum was held in October 2022 and was attended by around 300 delegates. Planning is currently underway for our second Forum to be held in May 2023.
Research and utilisation workshops held (10)	30-Jun-23	30-Jun-23	70%	<p>The following research and utilisation workshops have been completed:</p> <ul style="list-style-type: none"> <li>End user research workshop with Tasmanian stakeholders, Hobart, September</li> <li>Research student workshop, Brisbane, October</li> <li>Research briefing on flood related research for Commissioner of NSW SES, Sydney, October.</li> <li><i>Getting to know Natural Hazards Research Australia</i> workshop focused on explaining the Centre's processes to end-users, online, November.</li> <li><i>Harkaway Bushfire Conversations</i>: Child-centred DRR research showcase at Harkaway Primary School, November.</li> <li>End user research workshop South Australian stakeholders, Adelaide, December</li> </ul> <p>The following research and utilisation workshops are planned:</p> <ul style="list-style-type: none"> <li>A series of workshops are planned to engage with end-users and researchers on policy shifts and next generation capability aligned with potential focus areas of the 2023-24 Biennial Research Plan</li> <li>Research utilisation workshops planned online for early 2023 on Black Summer completed research outputs and on current projects underway.</li> <li>A research writing workshop is planned to be conducted jointly with the University of Melbourne in the first half of 2023.</li> <li>Research workshops for ACT and Western Australia and a further research workshop for South Australia</li> </ul>
Subject matter workshops and symposia held (10)	30-Jun-23	30-Jun-23	50%	<p>The following subject matter workshops and symposia held:</p> <ul style="list-style-type: none"> <li>Pyrogeography research seminar with Uni of Tasmania, August</li> <li>An introduction to the NHRA lifelines project, November</li> <li>Workshop on Soil Health and Fire, December</li> </ul> <p>The following workshops are planned in Qtr 3 and Qtr 4:</p> <ul style="list-style-type: none"> <li>Rising to the Challenge: voluntary purchase, retrofitting and house raising workshop, with Prof Gavin Smith, North Carolina State University, February, webinar.</li> <li>Black Summer research projects summary, workshops</li> <li>Post-flood social research, workshops</li> </ul>
Scenario based exercise held	30-Jun-23	30-Jun-23	10%	Planning underway

# Additional Activities

The following additional activities have been completed:

## Trusted Independent Advisor

- CEO participation in an Independent Planning Commission Technical Advisory Group to advise on high-risk flood prone developments consistent with the NSW Flood Inquiry.
- CEO invited to participate in the Disaster Ready Fund Assessment Panel for Round One.
- CEO participation in NSW Treasury project to develop cost-benefit analysis tool for natural hazard mitigation arising from the NSW Flood Inquiry.
- Participation on a grant assessment panel for the NSW Bushfire Commercialisation Fund for the NSW Office of the Chief Scientist and Engineer.
- Briefing to the US Department of Homeland Security
- Submission to the Finance and Public Administration Legislation Committee regarding the Emergency Response Fund Amendment (Disaster Ready Fund) Bill 2022.
- Regular meetings with various State and Federal government ministers and/or staff.
- Provision of research knowledge to inform the National Resilience Taskforce led by Home Affairs.

## Promoting research and building partnerships

- Partnering with numerous industry conferences including:
  - Asia-Pacific Ministerial Conference on Disaster Risk Reduction



- AFAC 2022, Adelaide as official Research Partner
- Disaster and Emergency Management Conference, Queensland
- Emergency Management Conference, Melbourne
- Emergency Media and Public Affairs Conference – Australia and New Zealand
- Compound events in Australia – strategic planning for multivariate risk

In addition, the Centre provided presentations at the following conferences, workshops and meetings:

- Information Systems for Crisis Response and Management Asia Pacific Regional Conference, CSO (keynote)
  - AFAC 2022, CEO keynote plus various researchers
  - Munich Re forum for Motor Clubs (keynote)
  - Australian Water Safety Summit (keynote)
  - Queensland Disaster Management Research Forum
  - UBS Investors Conference
  - Home Affairs Industry Summit
  - Insurance Surveyors Discussion Group
  - Engineers Australia Risk Engineers Society webinar
  - University of Newcastle Flood Resilience Workshop
  - University of Western Sydney Environmental Health course
  - NSW SEMC Capability Development Sub-Committee
  - NSW SEMC Community Engagement Sub-Committee
  - Floodplain Management Australia Quarterly Meeting
  - International Universities Climate Alliance
  - Volunteering Australia – Volunteering Research Papers Initiative, Sept 2022
  - Spatial Futures Workshop, Nov 2022
- Regular engagement with end-users in one-on-one partner catch-ups
- Initial meeting of End User Advisory Panel on 18 October. The next meeting is scheduled for May 2023.
- CEO presentation to the AFAC Council on Centre’s activities on 26 October.
- CEO meeting with CEO of CSIRO to discuss collaboration opportunities.

## Commitment to Reconciliation

The Centre completed a detailed consultative and learning process before launching its Reconciliation Action Plan (RAP) in October at the Natural Hazards Research Forum. The RAP is a symbol of the Centre’s commitment to First Nations reconciliation. All staff also participated in a half day Building Aboriginal Cultural Competency training session run by the Koorie Heritage Trust.



## International Research Advisory Panel

The International Research Advisory Panel was confirmed and held its first meeting in November 2022. The panel comprises:

- Dr Amy Cardinal Christianson, Fire Social Scientist, Northern Forestry Centre (Canada)
- Professor Roland De Marco, Pro Vice-Chancellor (Research and Innovation), Fiji National University (Fiji)
- Dr Mark Finney, Research Forester (Rocky Mountain Research Station) USDA Forest Service (US)
- Associate Professor Susanna Jenkins, Earth Observatory of Singapore, Nanyang Technological University (Singapore)
- Professor Jessica Lamond, University of the West of England (UK)
- Dr Sarah McCaffrey, Research Forester, US Forest Service Rtd. (US)
- Dr Richard Smith, Research Strategy and Science Investment, Earthquake Commission (NZ)
- Professor Thomas Wilson, Chief Science Advisor, NEMA (NZ)

## Governance

### Board

The Board has met three times over the reporting period (29/9, 2/11 & 6/12). The next meeting of the Board will be in February 2023.

### AGM

The Annual General Meeting was held on the 28 November. Dr Katherine Woodthorpe retired as chairperson. Iain McKenzie has been appointed as the new Board Chairperson. The appointments of Oliver Costello and Dominique Hogan-Doran to the Board were approved.

### Research and Implementation Committee

The Research and Implementation Committee met once (7/11) over the reporting period to consider a round of proposed projects. The next meeting of the Committee will be held in April 2023.

### Education and Education Committee

The Education and Training Committee met once (21/11) over the reporting period and considered pathways for increasing involvement of Indigenous researchers. The next meeting of the Committee will be in April 2023.

### Risk and Audit Committee

The Risk, Audit and Compliance Committee met twice (5/9 & 17/10) over the reporting period to consider a new risk management policy, revisions to the risk register and to consider the annual financial audit.

### End-User Advisory Panel

The first meeting of the End-User Advisory Panel was held on the 18 October. The terms of reference for the panel were endorsed and a presentation on the current status of the Centre was provided to members.

# Upcoming events

- *Rising to the Challenge – learning from natural hazards to build resilient communities.*  
A webinar with Prof Gavin Smith, North Carolina State University, 14 February
- A series of national workshops are planned to engage with end-users and researchers on policy shifts and next generation capability aligned with potential focus areas of the 2023-25 Biennial Research Plan.
- Research utilisation workshops planned online for early 2023 on Black Summer completed research outputs and on new projects underway.
- A research writing workshop is planned to be conducted jointly with the University of Melbourne in the first half of 2023.
- Natural Hazards Research Forum – 1-3 May, Melbourne.

# Employment

## **New jobs to deliver Centre activities**

- Appointment of Chief Science Officer, Professor Deb Bunker, from University of Sydney



- T1-A2 Predictions in Public: Approx 1.0 FTE combined (various positions for fixed terms across the duration of the project)
- T1\_A3 – Cultural Land Management Northern – \*0.5 FTE (hiring of indigenous researchers)
- T1-A4 Cultural Land Management Southern – 0.5 FTE combined
- T1-A5 Community led recovery: 0.6 FTE – Research Fellow for duration of the project
- T1-E2 Resilience of lifelines: 1 FTE – Research Fellow for duration of the project
- NSW/QLD flood project – 0.8 FTE (Principal Research Scientist); 0.4 FTE; 0.3 FTE; 0.2 FTE

# Attachment 1 – Current Projects

## Tranche 1

Project Name	Project Status	Summarised Outcomes Targeted	Stakeholders
<b>T1-A1</b> Translation of observed and modelled extreme bushfire behaviours to improve fire prediction and fireground safety	Contract fully executed	<ul style="list-style-type: none"> <li>→ Provision of the new modules as post PUA training professional development options</li> <li>→ Increased situational awareness and fire ground safety – interoperable language and concepts/ shared understanding</li> <li>→ Improved risk communication</li> </ul>	Stakeholders: BOM, AFAC, CFA, SA DEW Research Partner: BOM; Curio
<b>T1-A2</b> Understanding the design, communication and dissemination of predictive maps to the public	Contract fully executed	<ul style="list-style-type: none"> <li>→ Gain an overview of the existing public information and warnings products across jurisdictions</li> <li>→ Develop a preliminary set of evidence-based guidelines for predictive/e map design</li> </ul>	Stakeholders: CFA, AFAC Research Partners: RMIT, QUT, Deakin, Swinburne
<b>T1-A3</b> Cultural land management (Northern): Connecting Indigenous people and the EM Sector – Effective partnerships	Contract fully executed	<ul style="list-style-type: none"> <li>→ Strengthen the collective Indigenous understanding and position on engagement in emergency management in Northern Australia, providing a stronger and better-informed foundation for future work practice and partnerships</li> </ul>	Stakeholders: NAILSMA, Aboriginal Research Practitioners Network, Local community, QFES, NTES/ PFES, DFES, Red Cross Research Partners: NAILSMA, Aboriginal Research Practitioners
<b>T1-A4</b> Cultural land management (Southern): Cultural Land Stewardship Research in Southeast Australia	Contract fully executed	<ul style="list-style-type: none"> <li>→ Strengthening collaborative governance and research involving Indigenous land and fire managers and state, territory, and local government agencies</li> </ul>	Stakeholders: ANU, Deakin, UMelb, NNE, UoW, Cape Otway Conservation Centre, DELWP, DFES, SA DEW Research Partner: Deakin University
<b>T1-A5</b> Community-led recovery: Evidence, dimensions, and supports for Community Recovery Committees	Contract fully executed	<ul style="list-style-type: none"> <li>→ Develop a shared understanding of the roles of Community Recovery Committees (CRCs)</li> <li>→ Test and validate the self-assessment tool built for CRCs that was developed in Phase 1</li> <li>→ Measure representativeness of CRC membership using a social network approach, to help inform future recovery policy.</li> </ul>	Stakeholders: ERV, Local government, NEMA, Tas DHHS, ERV, Red Cross Research Partner: Umelb
<b>T1-A6</b> Identifying water sources for aerial firefighting (awaiting formal proposal)	Contract fully executed	<ul style="list-style-type: none"> <li>→ Explore the suitability of Sentinel 2-based waterbody insights.</li> </ul>	Stakeholders: NAFC, AFAC, GA, Frontier SI, CFA, NSW RFS Research Partner: Frontier SI
<b>T1-E1</b> Bushfire information database– scoping study	Contracting in progress	<ul style="list-style-type: none"> <li>→ This scoping study will provide an evidence base and recommendations that can be used to support the development of a National Bushfire Information Database</li> </ul>	Stakeholders: AFAC, Forest Fire Management Group, Fire management agencies Research Partners: USyd, RMIT, CSIRO
<b>T1-E2</b> Understanding the resilience of lifelines for regional and remote communities	Contract fully executed	<ul style="list-style-type: none"> <li>→ Increased knowledge about Australia's lifeline characteristics, interconnections, vulnerabilities, strengths, needs and opportunities for improving resilience, of relevance to practitioners and researchers.</li> <li>→ Understanding of the primary research needs and opportunities around lifeline resilience in Australia to strategically inform future work at NHRA and other organisations.</li> </ul>	Stakeholders: NEMA, East Gippsland Shire, Australian Red Cross, Energy Networks Australia, VCOSS Research Partner: RMIT
<b>T1-P1</b> Research data management	Contract fully executed	<ul style="list-style-type: none"> <li>→ The project will establish a research data management initiative for sharing research data as the outcome of bushfire research undertaken through NHRA projects, and where practical, from projects previously undertaken by the BNHCRC.</li> </ul>	Stakeholders: Internal-NHRA; AFAC, ACS, NBIC Research Partner: ARDC

## Tranche 2

Project Name	Project Status	Summarised Outcome Targeted	Stakeholders
<b>T2-A1 Awareness, education and warning programs for concurrent and cascading events</b>	Contracting in progress	<ul style="list-style-type: none"> <li>→ Improve shared understanding of the threats posed by compound disasters</li> <li>→ Inform community engagement programs and agency capacity to ensure the public understand compound disasters, associated risks and how to prepare for them</li> <li>→ Enhance communications planning in the context of disaster recovery</li> </ul>	Stakeholders: Red Cross, BOM, EMV, Environment NSW, FRNSW, Moreton Bay Regional Council, NEMA, NSW RFS, NSW SES, QFES, QRA, SA SES, TFS, Vic SES Research Partner: TBC
<b>T2-A2 Improved predictions and warnings for flash flooding</b>	Project planning in progress	<ul style="list-style-type: none"> <li>→ This project will help end-users to better understand how to prepare systems, people, and public messaging and warnings to reduce impact from flash flood and enhance community resilience.</li> </ul>	Stakeholders: Tas SES, NSW SES, BOM (Possible: State Emergency Services, ABC Emergency) Research Partner: BOM
<b>T2-A3 Protecting residential properties from the effects of bushfire</b>	EOI in progress	<ul style="list-style-type: none"> <li>→ Provide a better understanding of the causes of the failure rates of homes</li> <li>→ What measures would best reduce failure rates</li> <li>→ Understanding social levers that could be better utilised to influence and support communities to better protect homes from bushfires.</li> </ul>	Stakeholders: CFA, NSW RFS (Possible: Rural Fire Services, Resilience Agencies, Insurance) Research Partner: TBC
<b>T2-A4 Decision making in emergency management</b>	Contracting in progress	<ul style="list-style-type: none"> <li>→ High capacity for effective and appropriate crisis decision making in the Australian and New Zealand emergency management sectors across all levels.</li> <li>→ Decision-making capacity to be supported by well designed and implemented training and learning products that build on existing programs and tools.</li> <li>→ A common, national approach to decision making across services and multi-agency training to support cross agency decision making.</li> </ul>	Stakeholders: AFAC, EMV, NT Emergency Service, Air services Australia, QFES, FRNSW, SA DEW, TFS, DFES Research Partner: CQU
<b>T2-A5 Rural-urban interface fires</b>	Contracting in progress	<ul style="list-style-type: none"> <li>→ Improved understanding of how community led / centred action can be engendered and supported within communities living at the RUI to reduce risks in and around the APZ</li> <li>→ The identification of the key site and vegetation characteristics that affect bushfire behaviour within the RUI, including garden plant flammability and garden arrangement / landscaping</li> <li>→ The development of informed fire behaviour modelling that captures interface and garden fuels, fire spread and ember production in RUI zones</li> <li>→ The identification and evaluation of potential mitigation measures for stopping and reducing the spread of fire into the RUI.</li> </ul>	Stakeholders: DFES, CFA, DEECA, NSW RFS, NSW DEW, SA CFS, TFS, QFES Research Partner: Utas
<b>T2-A6 Enhancing severe weather impact prediction</b>	EOI in progress	<ul style="list-style-type: none"> <li>→ Identification of end-user needs for impact based forecasting.</li> </ul>	Stakeholders: BOM/GA Research Partner: TBC
<b>T2-A7 Modelling Impacts of Sequential Cascading Natural Hazards on the Built Environment</b>	EOI in progress	<ul style="list-style-type: none"> <li>→ Improved ability to estimate direct costs of infrastructure damage and to assess the financial benefits of infrastructure betterment in the context of current and future climates</li> </ul>	Stakeholders: GA, Australian Building Codes Board (ABCB), SES's, QFES, NSW RFS, NSW Treasury, NSW DPE, ACS, TAS Networks Research Partner: TBC
<b>T2-A9 Natural hazards and resilience in complex urban systems (Formerly 'Mitigating natural hazard impacts in urban environments')</b>	EOI in progress	<ul style="list-style-type: none"> <li>→ This project will lead to greater understanding of the multidimensional disaster impacts arising from natural hazard events for communities located in major urban areas in Australia, and the ways in which these impacts may change over time under the influence of climate change and rapid urbanisation.</li> </ul>	Stakeholders: Australian Red Cross, NEMA, Res NSW, QFES, NSW SES, FRNSW, QRA Research Partner: TBC



## Tranche 3

Different projects are at different stages of the project life cycle as indicated below.

Project Name	Project Status	Summarised Outcomes Targeted	Stakeholders
<b>T3-A1</b> What makes a good fire simulator	Contracting in progress	→ The AFAC Predictive Services Group will use this research to help define the development of Spark and ensure that it meets the needs of its users. Existing simulator users will also use it to evaluate current practice and use, justify changes to simulators, guide the development of new versions of simulators, justify new simulation methods of work and aid in interpreting predictions and outputs	Stakeholders: AFAC; BOM; DEECA Research Partner: UniMelb
<b>T3-A2</b> Storing and sharing qualitative data	Contract fully executed	→ Develop a strong foundation and clear pathways for the Centre and its researchers to implement the effective collection, use, curation and sharing (where feasible) of qualitative social research data.	Stakeholders: All NHRA stakeholders undertaking research Research Partner: Altometer
<b>(T1-A2)</b> Predictions in public: Phase 2 and 3	Contracting in progress	→ Informing the scope, content, and methods used in research conducted in phase 1 and refining the outcomes of the project (particularly phases 2 and 3).	Stakeholders: CFA, AFAC PSG, AFAC WG Research Partner: RMIT, QUT, Deakin
<b>T3-A3</b> State-wide community risk assessment project	Contracting in progress	→ Better understand the value in having a systematic approach to community-based risk that takes advantage of the latest computational and risk modelling advances.	Stakeholders: NSW SES Research Partner: USyd
<b>T3-A4</b> Case studies	Project planning underway	→ The project aims to build on the Bureau's capability for preparing high-value case studies by developing a defined methodology.	Stakeholders: BOM, other fire agency partners Research Partner: TBC

## Post event projects

Project Name	Project Status	Summarised Outcomes Targeted	Stakeholders
<b>NSW/Qld post floods</b>	On track	→ Provide an in-depth understanding of the community lived experience before, during and following the February and March 2022 flood events to assist future planning and engagement	Stakeholders: QFES, NSW SES Research Partner: Maq Uni, UQ, QUT
<b>Tasmanian post floods</b>	Project in development.	→ TBC – Provide an in-depth understanding of the community lived experience before, during and following the recent flood events to assist future planning and engagement → To evaluate effectiveness of Australian Warning System	Stakeholders: Tas SES Research Partner: UTas
<b>Victorian post floods</b>	Project in development.	→ TBC – Provide an in-depth understanding of the community lived experience before, during and following the recent flood events to assist future planning and engagement	Stakeholders: VICSES and DEECA Research Partner: TBC
<b>Understanding floodwater contamination risks</b>	Sampling and analysis completed.	→ The project aims to understand floodwater contamination risks to inform community engagement programs.	Stakeholders: Vic EPA, Vic SES Research Partner: Vic EPA

## Tranche 4 (FY21/22 Round 2)

The table below provides an update on the latest round of project concepts that were endorsed by the R&I in the November 2022 meeting and approved for funding by the Board in December 2022.

Project Name	Project Status	Summarised Outcomes Targeted	Stakeholders
<b>T4-A1 Identifying and defining landscape dryness thresholds for fires</b>	Agency notified of outcome. Centre working to develop a research brief	<ul style="list-style-type: none"> <li>→ Review and describe the range of landscape dryness products that have been developed, are in use or may potentially be applied in Australia.</li> <li>→ Compile and characterise operational uses for land dryness indices in Australia including the AFDRS.</li> <li>→ Evaluate landscape dryness products (weather and satellite derived) and describe their sensitivity and specificity in identifying when and where mission critical events may or may not occur.</li> <li>→ For dryness products that have potential for supporting decision making, identify thresholds for mission critical events and make recommendations on their strengths and limitations.</li> <li>→ Develop approaches for mapping landscape dryness to deliver operational intelligence. This may entail developing a new dryness index or calibrating or restructuring indices to account for vegetation productivity or drying rates.</li> </ul>	CFA; NSW RFS; ACT Parks; DFES
<b>T4-A2 Capturing uncertainty in bushfire spread predictions using Bayesian modelling and real bushfire observations</b>	Agency notified of outcome. Centre working to develop a research brief	<ul style="list-style-type: none"> <li>→ A developed Bayesian ROS model for forest (and grass a second priority), giving FBANs an additional, powerful tool to understand expected ROS probabilistically (which currently does not exist).</li> <li>→ ROS database that could be regularly updated and shared with fire agencies and researchers.</li> <li>→ Quick access to the history of ROS available to FBANs to understand how a particular fire sits in the context of previous fires</li> </ul>	NSW RFS; CFA; DEECA, AFAC
<b>T4-A3 Long-range flood outlook for strategic preparedness</b>	Agency notified of outcome. Centre working to develop a research brief	<ul style="list-style-type: none"> <li>→ This project aims to build a suite of national probabilistic long-range flood outlook and inundation products as a proof-of-concept for evaluation and testing.</li> </ul>	AFAC – SWISTG Vic SES; QFES; ACT SES; BoM.
<b>T4-A4 (a) Healing Country Through Wolgalu/Wiradjuri Land Management and (b) Scoping the operationalisation of Aboriginal Land Management at a landscape wide scale</b>	Agency notified of outcome. Centre working to develop a research brief	<ul style="list-style-type: none"> <li>→ A) This project will run on-Country activities to revitalise and share cultural knowledge and to develop resources that tell Wolgalu/Wiradjuri histories and knowledge of Country. The project will better understand what Wolgalu/Wiradjuri Caring for Country looks like today.</li> <li>→ B) The primary aim of this project is to provide the foundational understanding necessary for implementing landscape ALM. With that foundational understanding, government support for implementation can be provided, and an accompanying research program to document learning and problem solving, along the lines of a living lab model, can be developed.</li> </ul>	Tumut Land Council, Heritage NSW, Cultural Fire Management Unit, DPE, AFAC
<b>T4-A5 Why fly? How do we know that aerial operations are effective and efficient?</b>	Agency notified of outcome. Centre working to develop a research brief	<ul style="list-style-type: none"> <li>→ Understand and build the existing user profile of Australia's aviation fleet across different landscapes.</li> <li>→ Understand the profile of the purposes for which the fleet is deployed and how effective that purpose has been.</li> </ul>	NAFC; NSW RFS; CFA; CFS; DFES
<b>T4-A6 Incentivising resilient reconstruction</b>	Agency notified of outcome. Centre working to develop a research brief	<ul style="list-style-type: none"> <li>→ This project will examine the extent to which resilient reconstruction incentivisation programs can reduce flood risk to homes and increase their insurability, by addressing the following two questions:</li> <li>→ How does a resilient reconstruction program enhance the physical and financial resilience of homeowners and communities?</li> <li>→ What are the key components of successful implementation of a resilient reconstruction program?</li> </ul>	QRA; IAG; RACQ; Suncorp; University of Queensland; University of Melbourne

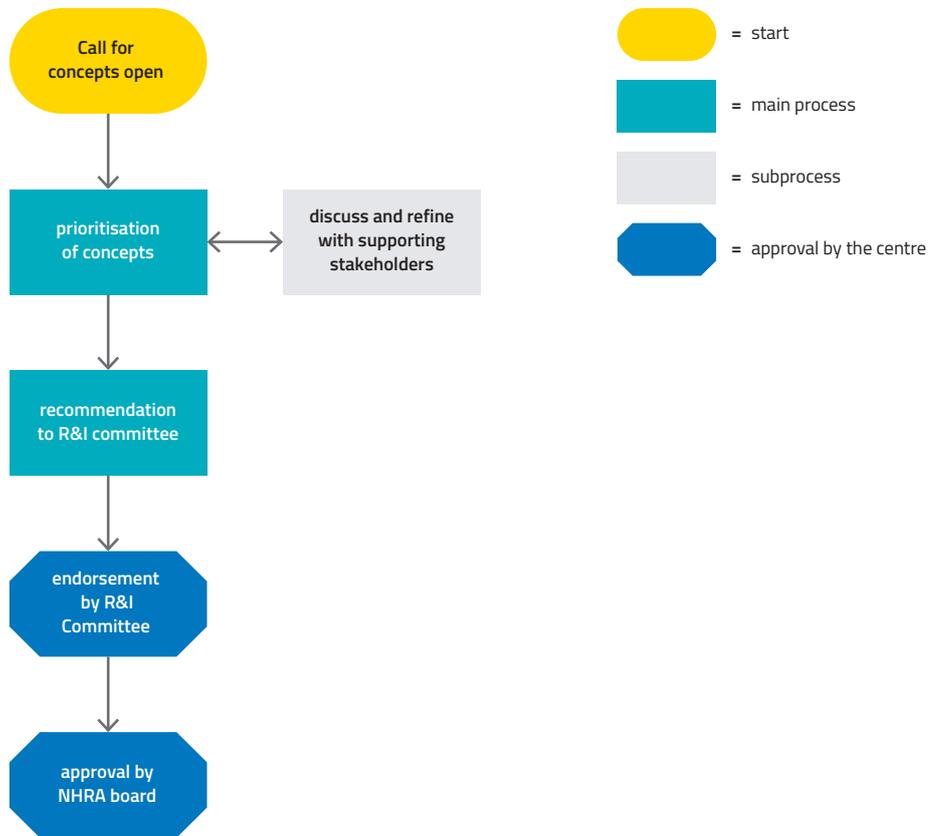
Project Name	Project Status	Summarised Outcomes Targeted	Stakeholders
<b>T4-A7</b> Developing an integrated predictive capability for extreme rainfall and inundation	Agency notified of outcome. Centre working to develop a research brief	→ Investigation of potential improvements to current forecast approaches	BOM; Vic SES; Tas SES; NSW SES
<b>T4-A8</b> Safety of Alternative and Renewable Energy Technologies (SARET) Research Program – Fire propagation in alternative energy storage systems	Agency notified of outcome. Centre working to develop a research brief. The project will likely be delayed due to end-user agency delays.	→ The project aims to investigate the risks related to fire propagation within and between stationary energy storage systems (from household to commercial scale) due to external factors related to bushfire, heatwaves, storms, and floods (such as fire impingement, temperature extremes, impact/shock, and water ingress) that are not considered in current best practice standards.	FR NSW, other urban and rural fire services, building regulators
<b>T4-A9</b> National Volunteer Sustainability Blueprint for Emergency Management	Agency notified of outcome. Centre working to develop a research brief	→ The aim of this project is to explore opportunities and collaboratively develop a sustainable volunteer system to better support EM volunteers (the people), volunteering (the activities) and volunteerism (the culture).	AFAC Volunteer Management Technical Group (VMTG), Workforce Management Group (WMG) and the Australian Emergency Management Volunteer Forum (AEMVF)

## Research extension projects

Project Name	Project Status	Summarised Outcomes Targeted	Key Stakeholders
<b>Mobile radar research and workshop</b>	Contracting in progress	<p>To provide an overview of proposed support by NHRA towards a multi-agency collaboration on the exploratory use of a mobile radar during prescribed burns and possibly wildfires in WA. This Project will:</p> <ul style="list-style-type: none"> <li>→ test the capability of mobile radar to detect fire plumes during prescribed burns and possibly wildfires in WA</li> <li>→ develop an unrestricted data set to be managed in the NHRA's data catalogue, and</li> <li>→ facilitate the strengthening of researcher and practitioner networks through cross-agency and cross-jurisdiction collaboration.</li> </ul>	BOM, DBCA, Monash, DFES, CFA, NSW RFS, SA DEW
<b>Maintenance of the Australian Flammability Monitoring System (AFMS)</b>	Contracting in progress	<ul style="list-style-type: none"> <li>→ ANU will continue to maintain the AFMS until it is fully operational and implemented by GA.</li> </ul>	ANU, GA,



# Attachment 2 – Project proposal process



# Attachment 3 – Post graduate projects

## Scholarship Students

Code EDU-	University	Project Title	Start Date	Expected Completion Date
0001	University of Tasmania	Creating resilient and sustainable critical infrastructure using evidence informed policy	11/07/2020	11/01/2024
0002	Deakin University	Cross-cultural relationships in natural resource management: Understanding the nature and experiences of partnership and collaboration	1/02/2021	1/02/2024
0003	University of Sydney	Multi-agency collaboration in disaster recovery after bushfire	1/10/2020	2026
0004	University of Melbourne	Exploring the role of civic technologies in community decision making in the face of climate change and disasters	1/04/2022	1/10/2025
0005	Federation University	A multi-component CBT for the treatment of insomnia and nightmares in survivors of bushfires presenting with PTSD	1/03/2021	1/03/2024
0006	University of New South Wales	Machine learning for humanitarian disaster relief efforts through employing rule-based verification on drone's aerial imagery	1/02/2019	1/02/2023
0007	University of Melbourne	Response, resilience and recovery of Tasmania's endangered Pencil Pine using a multi-archive palaeoenvironmental record	1/02/2019	2/09/2023
0008	University of Sydney	Determining changes in Eucalyptus litter during decomposition	1/01/2022	31/12/2023
0009	Victoria University	Parametric study of the transition from a surface fire to a crown fire through physics-based modelling	1/01/2023	1/07/2026
0010	University of Wollongong	Developing novel geochemical and spectroscopic techniques to extend existing bushfire records	15/02/2021	15/02/2024
0011	University of Melbourne	Effect of mulching on bushfire impact and risk to communities	1/09/2022	1/03/2026
0012	Edith Cowan University	Smoke exposure profiles of bushfire fighters in the southwest ecoregion of Western Australia	1/03/2022	1/03/2025
0013	University of the Sunshine Coast	Mitigating fire through water management in the Wildland Urban Interface	25/02/2022	28/06/2025
0014	University of New South Wales	Assessing post-fire forested ecosystem by using Spaceborne LiDAR over south-eastern Australian	19/09/2019	10/09/2023
0015	University of Wollongong	Planning for Bush Fire Protection: maintenance of protection measures	1/02/2021	1/08/2024
0016	University of Melbourne	Impact of fires on temperate rainforests in northern New South Wales	1/04/2021	1/04/2024
0017	Victoria University	Parameterisation for a simplified short-range firebrand model from physics-based modelling	1/06/2020	30/11/2023
0018	University of New England	Why do people decide to drive through floodwater? Utilizing virtual reality to assess motivations and behaviour associated with driving through floodwater.	1/01/2017	20/02/2021 (Leave of absence)
0019	Royal Melbourne Institute of Technology	Remote sensing of fuel to improve fire behaviour predictions in Mallee and Heathy shrublands	1/01/2021	1/06/2024



<b>0020</b>	University of Western Australia	Fighting the fires within: breaking down the barriers to mental help-seeking amongst first responders with post-traumatic stress disorder (PTSD) and high psychological distress	1/03/2019	1/09/2022
<b>0021</b>	Royal Melbourne Institute of Technology	Landscape architecture design and development of natural systems wastewater treatment and landscape design	1/03/2019	28/02/2023
<b>0022</b>	Royal Melbourne Institute of Technology	Towards fire-adaptive communities in the Australian landscape: A framework to address rapid and slow onset fire emergencies into an uncertain future	1/02/2019	31/01/2023
<b>0023</b>	University of New South Wales	Impact of bushfire smoke on eye surface	24/05/2020	23/05/2024
<b>0024</b>	University of Tasmania	Exploring leadership for municipal climate change adaptation planning and implementation	27/11/2019	24/11/2024
<b>0025</b>	University of Sydney	Strengthening the experiences of people who are deaf or hard of hearing during extreme weather events and other disasters	24/05/2020	23/05/2024
<b>0026</b>	Victoria University	Physics-based modelling of field-scale junction fire	27/11/2019	24/11/2024
<b>0027</b>	RMIT	Correcting vertical errors in a global Digital Elevation Model, to derive a "bare earth" terrain surface for improved flood modelling in data-scarce regions	1/03/2023	1/09/2026
<b>0028</b>	University of Queensland	Focusing on the intersection of community resilience and energy resilience	20/02/2023	20/08/2026
<b>0029</b>	University of Canberra	The effect of disrupted social connection on wellbeing during prolonged disasters	1/08/2021	1/02/2025

## Associate Students

Code AST-	University	Project Title	Start Date	Expected Completion Date
0001	University of Queensland	Conflict in disaster recovery: Why does it happen? What can we do about it?"	1/04/2022	1/06/2025
0002	University of Auckland	An integrated modelling approach for the planning of collaborative and adaptive wildfire risk-reduction activities	1/04/2022	31/05/2024
0003	University of Queensland	The effectiveness of rapid evidence in fast-paced policy contexts	1/04/2022	1/01/2025
0004	Griffith University	Working together or working apart? – Interoperability and organisational culture across RESLEM agencies and organisations during major disaster responses.	1/05/2022	30/04/2026
0005	Griffith University	How can hospitals improve their resilience and ensure business continuity during disasters	1/05/2022	14/10/2022
0006	University of British Columbia	Restor(y)ing fire-adapted territories: wildfire recovery, Indigenous leadership and restoration in Secwepemcúl'ecw	1/01/2022	12/12/2022
0007	Griffith University	Enabling governance for sustainable and resilient regional food system development in Australia	1/07/2022	24/03/2024
0008	Griffith University	Urban green space is a critical component for children living in urban areas to enrich their mental and physical development	1/05/2022	13/07/2024
0009	University of New South Wales	Impact of bushfire smoke on ocular surface	1/07/2022	25/05/2024
0010	Central Queensland University	Agency experts supporting bushfire disaster resilience education for primary school students: a case study in NSW	1/07/2022	20/01/2028
0011	University of Canberra	Understanding people's communication needs in a natural disaster crisis	1/08/2022	1/02/2025
0012	University of Sunshine Coast	An empirical and dynamic tool for prediction forest fire spread using remote sensing and machine learning technique	1/09/2022	1/07/2025



# Attachment 4 – ECR Projects

<b>Code FLW-</b>	<b>University</b>	<b>Project Title</b>	<b>Start Date</b>	<b>Expected Completion Date</b>	<b>Round</b>
<b>0002</b>	The University of Adelaide	Interdisciplinary collaborative platform for reducing future bushfire risk and increasing community resilience	28/04/2023	27/08/2023	2
<b>0003</b>	The University of Melbourne	Developing strong research partnerships outside Australia	01/07/2023	31/7/2023	2
<b>0004</b>	The University of Adelaide	Wildfire law and policy network and website	01/02/2023	01/06/2023	2