Natural Hazards Research Australia

Biennial Research Plan 2023–25

Natural Hazards Research Australia

Australian Government

Natural Hazards Research Australia's staff work from Burramattagal, Dharawal, Dharug, Dja Dja Wurrung, Gadigal, Turrbal/Yuggera, Wadawurrung, Wangal and Wurundjeri Countries. We thank and acknowledge the Traditional Custodians of these lands and all the lands where we work, live and walk, and pay our respects to Elders past, present and emerging. We recognise that these lands and waters have always been places of teaching, research and learning, and that sovereignty has not been ceded. We are committed to strengthening reconciliation and building resilience through respectful and empowering relationships with First Nations communities, peoples and partners.

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The Centre's research strategy

Natural Hazards Research Australia (the Centre) is Australia's research centre for natural hazards resilience and disaster risk reduction. The Centre works closely with the Australian Government and other participating organisations across Australia to deliver a strategic research agenda for the nation and actively promote research utilisation.

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

The Centre undertakes research that promotes resilience to the impacts of natural hazards[1] and reduces disaster risk, to support the needs of a variety of critical stakeholders – including government, emergency service agencies, industry and communities.

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.

The research program is informed by the Centre's *10-Year Research Strategy 2022* and the *National research priorities for disaster risk reduction and community resilience to the impacts of natural hazards* (2022; see References), as well as ongoing engagement with end-users and researchers, recent natural hazards, and relevant inquiries and post-event reviews.

Vision

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

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.

1 Natural hazards are defined as sudden-onset hazards. Highlighted by the Australian Government under the funding agreement are bushfire, flood, cyclone, heatwave, storm, inundation and erosion caused by sea level rise, earthquake, tsunami and landslide.

Purpose and framing of this Biennial Research Plan

Biennial Research Plans are an important element of the Centre's research governance.

The *Biennial Research Plan 2023–25* outlines the Centre's research activities and how they will deliver the outcomes described in the Centre's *10-Year Research Strategy 2022* and *Strategic Plan 2021–2031* (see References).

This plan provides an overarching strategic guide for the Centre's research activities and describe the Centre's research performance targets. It provides a two-year outlook and will be reviewed on a 12-month cycle – to retain the two-year outlook.

Research themes

The Centre's research themes provide a broad framework for the research program. These themes are described in more detail in the *10-Year Research Strategy 2022* and include:

- Communities and workforces of the future
- Sustainable, safe and healthy natural landscapes
- Resilient built environment
- Resilient communities
- Situational awareness
- Operational response and innovation
- Evidence-informed policy, strategy and foresight
- Learning from disasters

These themes and the associated influencing factors were developed through consultation with end-users and research organisations.

The Centre continues to engage with its participants to ensure its research program is driven by the needs of government, emergency services, industry and the community to maximise relevance and value.

Context

Australia is susceptible to a diverse range of natural hazards. The last three years, beginning with the 2019–20 bushfire season, have illustrated the impacts of compounding natural hazards and their intersection with longer-term stressors such as the COVID-19 pandemic. For example, some communities have experienced the impacts of five different floods while managing the COVID-19 pandemic.

Overall, the financial costs of natural hazards are growing, placing greater pressures on the resilience and sustainability of communities. The Royal Commission into National Natural Disaster Arrangements concluded that natural hazard emergencies are expected to become more complex, more unpredictable and more difficult to manage.

Drivers of natural hazard risk

There are several drivers influencing natural hazards and associated vulnerability, exposure and capability, now and into the future. These include:

- environmental change, inclusive of:
  - changes in the future frequency and severity of natural hazards
  - biodiversity loss.
- societal change, inclusive of:
  - population increases in at-risk areas
  - increases in the diversity of the population
  - urbanisation of population
  - aging population
  - increases in social isolation with more people living alone
  - increased use of digital devices and the internet
  - increases in the rates of chronic diseases.
- built environment change, inclusive of:
  - increasing complexity and interdependence of infrastructure networks and systems
  - increased use of renewable energy technologies such as batteries, electric vehicles etc and decentralised energy systems such as microgrids
  - aging infrastructure impacting the reliability of services
  - growing demand for green infrastructure
  - increases in population necessitating commensurate growth in building stock.
- capability change, inclusive of:
  - technological change, including the growth of quantum computing
  - widespread adoption of artificial intelligence (AI)
  - next-generation communications (for example, 5G and satellite)
  - sensors (including satellite technologies)
  - augmented reality
  - digital twins
  - hypersonic transport
  - autonomous vehicles
  - creation of a metaverse.
- workforce trends, inclusive of:
  - declining rates of formal volunteering
  - increasing workforce diversity
  - increasing flexible working.

- political and economic change, inclusive of:
  - the impact of the COVID-19 pandemic and the war in Ukraine on Australia's economic circumstances
  - geo-political stressors
  - increases in Australians' wealth
  - rising insurance premiums.

There are many possible implications of these changes, but those of significance include:

- continued rising impacts of natural hazards and increased demands on scarce disaster management capability
- increased number of people living in recovery and increased demands on government funding
- increased complexity of natural hazards due to increased interconnectedness of systems
- rising insurance unaffordability in high-risk areas
- species and habitat loss
- greater capability to manage natural hazards through technological change.

International, national and local policy is changing to embrace a greater focus on disaster risk reduction, including greater investments in mitigation. This is evidenced by recent increases in disaster mitigation funding by the Australian Government and investment in house acquisition, retrofitting and raising projects, following the 2022 eastern Australia floods.

Key policy questions currently under discussion at various levels of government and industry include:

- How can insurance be made more affordable?
- What is the most appropriate land-use planning/urban design policy framework to accommodate natural hazard risk?
- What is the role of the Australian Defence Force and what broader role could NGOs and businesses play in disaster management? Does Australia need a national disaster and recovery response force?
- How best is resilience built after a disaster? Should communities be re-built? What is the future of communities faced with increased frequency of extremes?
- How can construction standards include resilience and future risk considerations?
- How much mitigation investment is required? What are the highest priority risks? Where are the mitigation priorities? What solutions are most effective? How can investment in mitigation be incentivised?
- What should a global standard for measuring nature, its condition and economic contribution be? What is the role for nature-based solutions?
- How can environmental resilience be achieved?
- How can First Nations people best be empowered to strengthen and protect landscapes and communities?

The Centre's research priorities for 2023–25

Based on an environmental scan of current risk, capability and policy trends (including themes from recent natural hazards and inquires) and feedback from participants and other subject matter experts, the Centre proposes a series of research and key capability areas.

The relationship between key research focus and capability areas is illustrated in Figure 1. These focus and capability areas are aligned with the Centre's strategic research priorities (see Figure 2).

2023–25 research focus areas

Understanding and mitigating risk

The *National Disaster Risk Reduction Framework* focuses the nation's attention on reducing risk through mitigation activities. The Framework establishes a vision that all sectors of society:

- make disaster risk-informed decisions
- are accountable for reducing risks within their control
- invest in reducing disaster risk in order to limit the cost of disasters when they occur.

The Australian Government is currently improving the understanding and management of natural hazard risk through the Australian Climate Service and the National Climate Risk Assessment. Natural Hazards Research Australia will continue to collaborate with these initiatives.

Research questions and projects that could be captured in this focus area include:

- What are the true costs of natural hazards?
- What are the drivers and science of future natural hazard risk and what are the management implications?
- What are the barriers, challenges and opportunities to achieving adaptation and transformation?
- What are the highest priorities for natural hazard mitigation?
- What hazard mitigation solutions are most effective?
- How can investment in natural hazard mitigation be encouraged?
- How can hazard treatments be managed to minimise impact on environmental, cultural and historical assets?
- How can maladaptation be avoided?

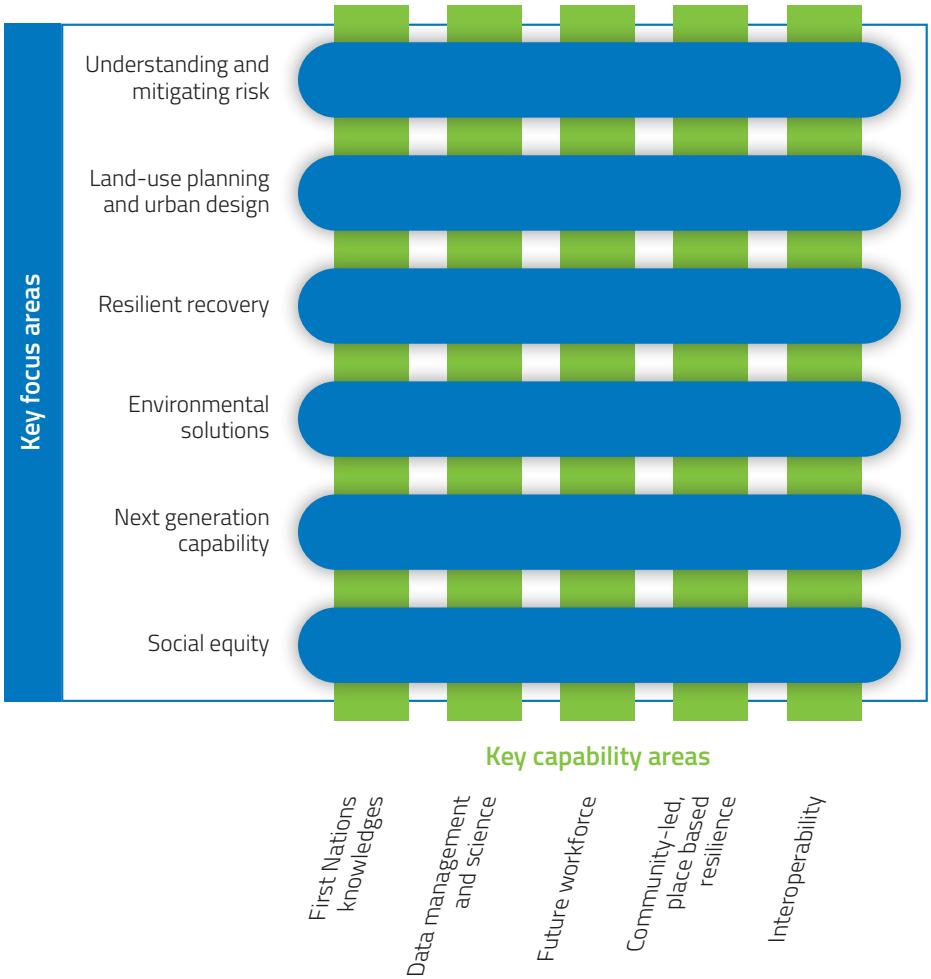

Figure 1: Key focus and capability areas

Land-use planning and urban design

Land-use planning and urban design are critical to reduce future natural hazard risk. Recent floods and bushfires have highlighted opportunities to consider developments in high-risk areas. National Cabinet is currently considering national standards for incorporating disaster and climate risk, as part of land-use planning and building reform processes.

Research questions and projects that could be captured in this focus area include:

- What is the effectiveness of existing land-use planning and urban design controls?
- How do we best accommodate current and future natural hazard risk and resilience considerations in land-use planning and urban design?
- How can risk-informed planning be encouraged and supported?
- How should essential infrastructure be managed to ensure resilience?
- How can risks associated with energy transition and evolving urban design be managed?

Resilient recovery

Recovery from natural hazards is a long-term and complex endeavour for any community. The *Sendai Framework for Disaster Risk Reduction 2015–2030* recognises opportunities to emerge stronger from natural hazards by embracing practices that build resilience and reduce natural hazard risk.

Research questions and projects that could be captured in this focus area include:

- What is the effectiveness of recovery practices?
- How is systems resilience improved?
- How are communities best re-built and transformed in recovery to build resilience and reduce natural hazard risk?

Environmental solutions

The Australian Government's 2021 Australia *State of the Environment* report highlighted the significant risks that natural hazards pose to the natural environment. There is growing interest in understanding how to improve environmental resilience and the efficacy of environmental solutions to reduce natural hazard risk.

Research questions and projects that could be captured in this focus area include:

- Where are the greatest risks posed to the environment by natural hazards?
- What is the efficacy of environmental solutions to reduce natural hazard risk?
- How can environmental solutions be incentivised?
- What are the environmental impacts of natural hazards and how does the environment recover?
- How are natural hazard risks altered by future environmental change?
- How is environmental resilience supported and engendered?

Next generation capability

Increases in the frequency and severity of natural hazards will lead to increased demand on disaster management capabilities. There is a need to develop the next generation of disaster management capability considering workforce, systems, technology, equipment and processes to ensure Australia's disaster management capabilities are a step ahead in the coming decades.

Research questions and projects that could be captured in this focus area include:

- What is the effectiveness and efficiency of existing capabilities? (for example, aerial firefighting)
- What are the needs for the next generation of emergency management capability and how is this built?
- How can better decision making be enabled for first responders and community members?
- How can risk simulation, analysis and communication be enhanced?
- How can the sustainability of disaster management workforce models be enhanced?
- How can first-responders be more effectively protected?

Social equity

Natural hazard risk is underpinned by social vulnerability which is inclusive of the impediments and capacities of people and communities to prepare for, respond to and recover from natural hazards. The *Sendai Framework for Disaster Risk Reduction 2015–2030* calls for dedicated action to address underlying risk drivers including inequality.

Research questions and projects that could be captured in this program include:

- What are the systemic causes of risk?
- What constitutes critical social infrastructure?
- How can disaster risk reduction strategies best address the needs of diverse communities?
- How can diversity and inclusion be promoted?
- How can resilience building initiatives address pre-existing social inequalities?
- How can resilience building initiatives be made more affordable?
- How can resilience building initiatives consider social equity?

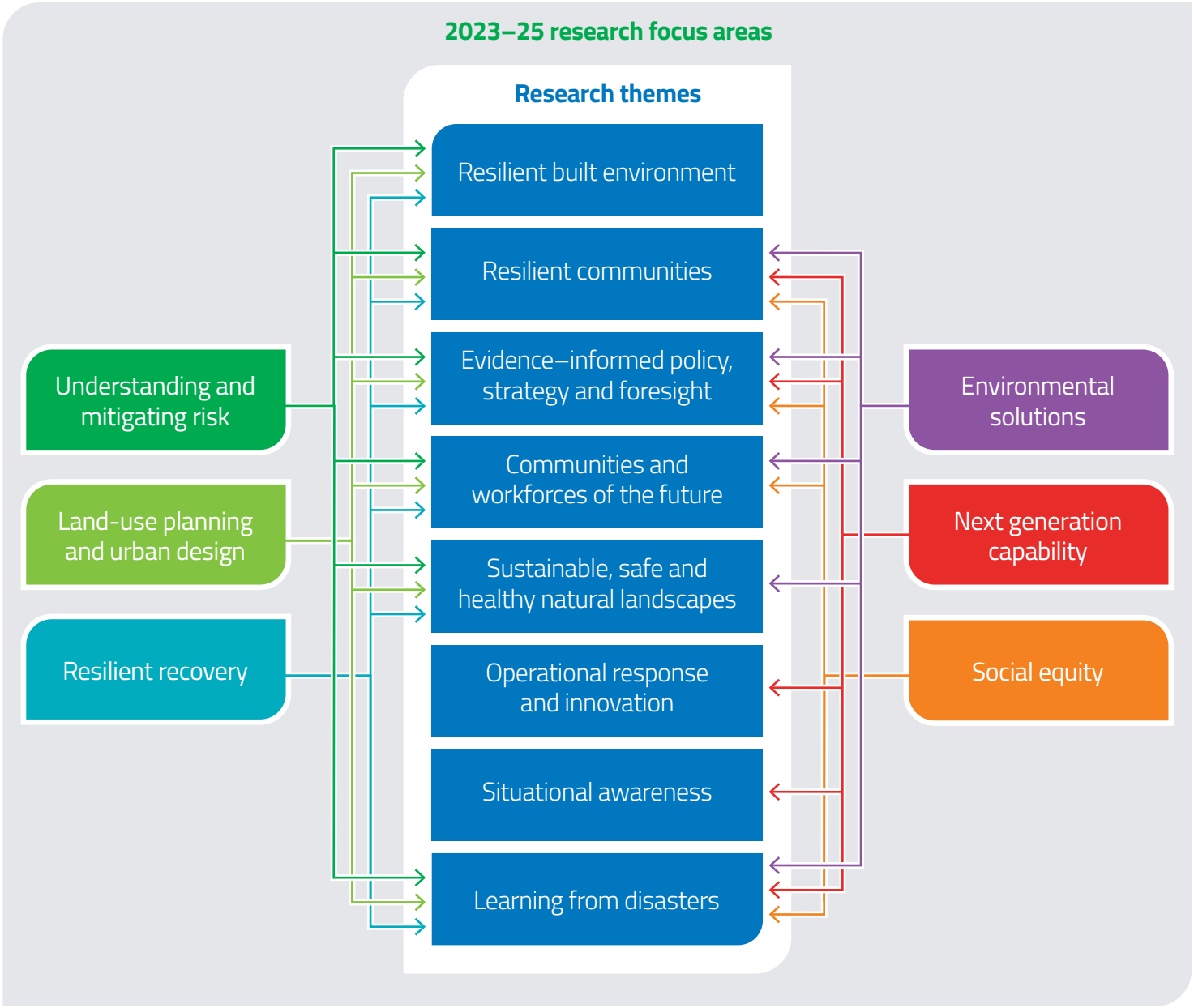

Figure 2: Relationship between 2023–25 research focus areas and Centre research themes.

Key capability areas

To support research focus areas, key capability areas have been identified. Key capability areas each cut across multiple research focus areas. These include:

First Nations knowledge

How can First Nations knowledge be better supported and utilised to enable First Nations people to build resilience and heal and manage land, whilst recognising the importance of First Nations peoples' involvement in disaster management?

The Centre's *Reconciliation Action Plan* (RAP; see References) outlines key First Nations-relevant deliverables, laying the foundations for strengthened connections and partnerships with First Nations peoples across the natural hazard research sector, and guiding the Centre's ongoing programs, processes and research activities.

The Centre will continue to establish key partnerships with First Nations peoples and organisations to build a research program that strengthens reconciliation.

Data management and science

How can information, communications and data management practices and the application of data science, sensing and monitoring support and enhance decision making?

The Centre is reviewing its *Research Data Management Framework* (see references) while establishing a data catalogue. The Centre's approach to data focuses on sector leadership in data collection management, identification, collation, curation and access.

An objective of the Centre is to demonstrate best practice in natural hazards research data management.

Future workforce

How do the implications, considerations and opportunities for current and future workforce (including volunteering) impact on our ability to prepare for, respond to and recover from natural hazards?

Community-led, place-based resilience

How are community-led initiatives for adaptation, preparedness, response and recovery best supported and engendered?

Interoperability

How can we best identify and support the development of national systems and capabilities when and where required?

Systems and capabilities with known research needs identified as an important focus in this research plan are:

- Australian Fire Danger Ratings System
- Fire simulation/fire prediction systems
- Aerial firefighting
- Extreme weather impact prediction

Opportunistic and responsive activities

The Centre retains an ability to invest in projects that are developed:

- by Centre participants in response to significant emerging needs
- to respond to significant disasters, or new natural hazard risks, as they occur
- to respond to novel emerging research ideas with modest levels of seed funding to explore early-stage innovative ideas.

Ordinarily, these projects would align to the Centre's current research focus areas, but may be funded, or otherwise supported, outside of the published funding rounds.

Updating the Centre's research priorities for 2024-26

The Centre's research priorities for 2024-26 will be developed and incorporated into the Centre's *Biennial Research Plan 2024-26*.

This update to the research plan will be informed by the *National research priorities for disaster risk reduction and community resilience to the impacts of natural hazards* (2022), engagement with Centre participants, end-users and researchers, recent natural hazards, and relevant inquiries and post-event reviews.

Responsive disaster research

The complex nature of disasters caused by natural hazards lends itself to using post-disaster research to gain insights that can make significant contributions to disaster risk reduction and strengthening of disaster resilience.

Therefore, responsive disaster research is one of the Centre's major research programs.

The Centre's rolling investment strategy will allow the flexibility to initiate or to co-invest in projects in response to specific natural hazards and other changes that affect vulnerability, exposure or resilience to disasters caused, or contributed to, by natural hazards.

Funding will be available through two research programs:

- Rapid Disaster Research Program for the Centre's end-user participants
- Quick Response Program for researchers – immediate collection of perishable data

The Centre will accept applications for funding through each of these programs following any significant disaster caused by a natural hazard.

Rapid Disaster Research Program

The Rapid Disaster Research Program (RDRP) enables the Centre to engage actively with its participants to identify essential research that is needed in the wake of a disaster caused by natural hazards. This could be through projects established by the Centre, or through co-investment with industry participants.

The RDRP will be used to assist in learning important lessons from disasters by addressing significant unresolved questions, collecting information that will be used to provide insights into the event and its outcomes, and to assist in disaster risk reduction or strengthening disaster resilience.

Quick Response Program

The Quick Response Program (QRP) provides funding for research data collection and can be used to directly supports researchers for out-of-pocket expenses, including travel to disaster-affected areas to collect time-critical, perishable data[2] following disasters caused by natural hazards.

The QRP will be used to assist in gaining an understanding of the impacts of a disaster.

From findings to learnings

To receive the benefits of projects supported through the RDRP and QRP, following the completion of each project, the Centre will work with the research teams and relevant end-users to communicate and share the learnings from each project in the most appropriate ways.

Open access data

The Centre requires that data collected through this program be made available to the Centre and made publicly available following the principles in the Centre's *Research Data Management Framework*, to ensure that it contributes to the national natural hazards data and knowledge collection.

This will contribute to building national datasets and in identifying significant insights and research questions arising from major natural hazards – providing a context for developing more extensive research proposals and for influencing the research priorities.

The Centre will develop an online data catalogue to promote and support research data accessibility. This data catalogue will develop a line of sight to all Centre project data holdings and facilitate sound research data curation and governance practices for all projects associated with the Centre.

Where financially possible, the Centre will support open-access publication of its outcomes.

2 Perishable data is data that must be gathered quickly after a disaster to ensure that it is not lost, and that its quality and relevance is not degraded. This can include, for example, an assessment of debris in the aftermath of a storm, before clean-up has commenced, or water quality in waterways following a bushfire, flood or landslide.

Actively engaging with other research initiatives

A number of researcher and industry-led research initiatives exist across Australia and it is likely that more will appear over time.

The Centre actively engages with these initiatives as they are developed and expects to continue that engagement. For example, the Centre sits on the Steering Committee for the NSW Bushfire and Natural Hazards Research Centre.

In addition, there are several research collectives and initiatives in the university sector undertaking research relevant to the Centre and its outcomes.

Collaboration options include:

- participation in governance arrangements and in working groups
- joint development of research projects or programs
- shared workshops.

Maintaining a dynamic research portfolio

The Centre's research is managed as a portfolio, where the composition of the portfolio will be influenced by the Centre's research focus (outlined in this and future updates of the Centre's Biennial Research Plans).

The research portfolio includes an appropriate mix of short-term (tactical), medium-term (applied) and long-term (strategic) projects.

The ongoing research portfolio is being developed and managed through strong engagement with Centre participants, guidance from research organisations and leadership from the Centre.

To ensure the portfolio remains relevant and capable of investing in research in a timely manner, there will be two formal investment rounds each financial year (assessed in October and April). The funding available for each funding round will be agreed annually by the Centre's Board.

Development of new projects

New project proposals will be evaluated and reviewed by the Research and Implementation Committee, before being endorsed by the Centre's Board.

All projects will have identified translation and implementation pathways that have been co-developed and agreed with relevant end-users before the commencement of each project. These pathways will be subject to regular review and updated as required.

Project governance

The Centre's projects will be managed by the Centre's research team using a formal governance structure and associated systems.

All projects will:

- have an agreed and documented project plan
- have identified research and end-user project leaders
- have clear end-user expectations and performance measures
- have a timeline that includes performance review stage-gates
- have a project management group
- be linked to a Translation and Implementation panel
- have regular reporting obligations
- be reviewed by the Research and Implementation Committee.

Translation, implementation and adoption of research outcomes

Research project outcomes will be clearly monitored and evaluated on a continuous basis to ensure that research is being adopted and utilised by end-user participants.

This process will focus on:

- translation (demonstrating that the outcomes of the project are fit for implementation)
- implementation (the roll out of project outcomes in participant organisations) and
- adoption/utilisation (uptake and use by participant organisations once the implementation phase is complete).

Monitoring and evaluation processes will be overseen by:

- Translation and Implementation Panels (subject matter professionals from participant organisations).
- Research and Implementation Committee (responsible to the Board for the Centre's research activities).
- Education and Training Committee (where the research outcomes are used to develop education and training information and products).

Reporting on the monitoring and evaluation of research adoption

The Centre's research portfolio will have clear and measurable outcomes (including performance targets where feasible)[3], coupled with formalised participant engagement and agreed adoption/utilisation pathways through development of clear implementation and adoption strategies.

These strategies will be developed in collaboration with Centre stakeholders and research providers and will be incorporated within the Centre's research projects, processes and workflows, from initial concept development, Expression of Interest response and project development, through to project reviews.

Given the extended timeframes that are often required between the start of a research project and the implementation of the outcomes and demonstration of adoption benefits, the Centre is developing a multi-pronged approach to identifying, capturing and recording progress of projects, and the benefits derived directly and indirectly from the implementation and adoption of research deliverables and other research outcomes.

The development of monitoring and evaluation approaches seeks to:

1. develop methods and processes that are fit for purpose
2. apply these across the five elements of standard program logic
3. utilising available and potential data sources on a continuing basis
4. produce regular and ad-hoc reporting as required on the Centre's research outcomes.

Reporting will reflect the short and medium impacts of projects as well as the long-term aspirational aims that underpin our research.

The monitoring and evaluation program logic is outlined in Figure 3.

3 Research performance targets will define the minimum performance required for the outcomes to have a demonstrable benefit to end-users, and that would be sufficient to justify end-user investment to integrate the outcomes into their business or operations.

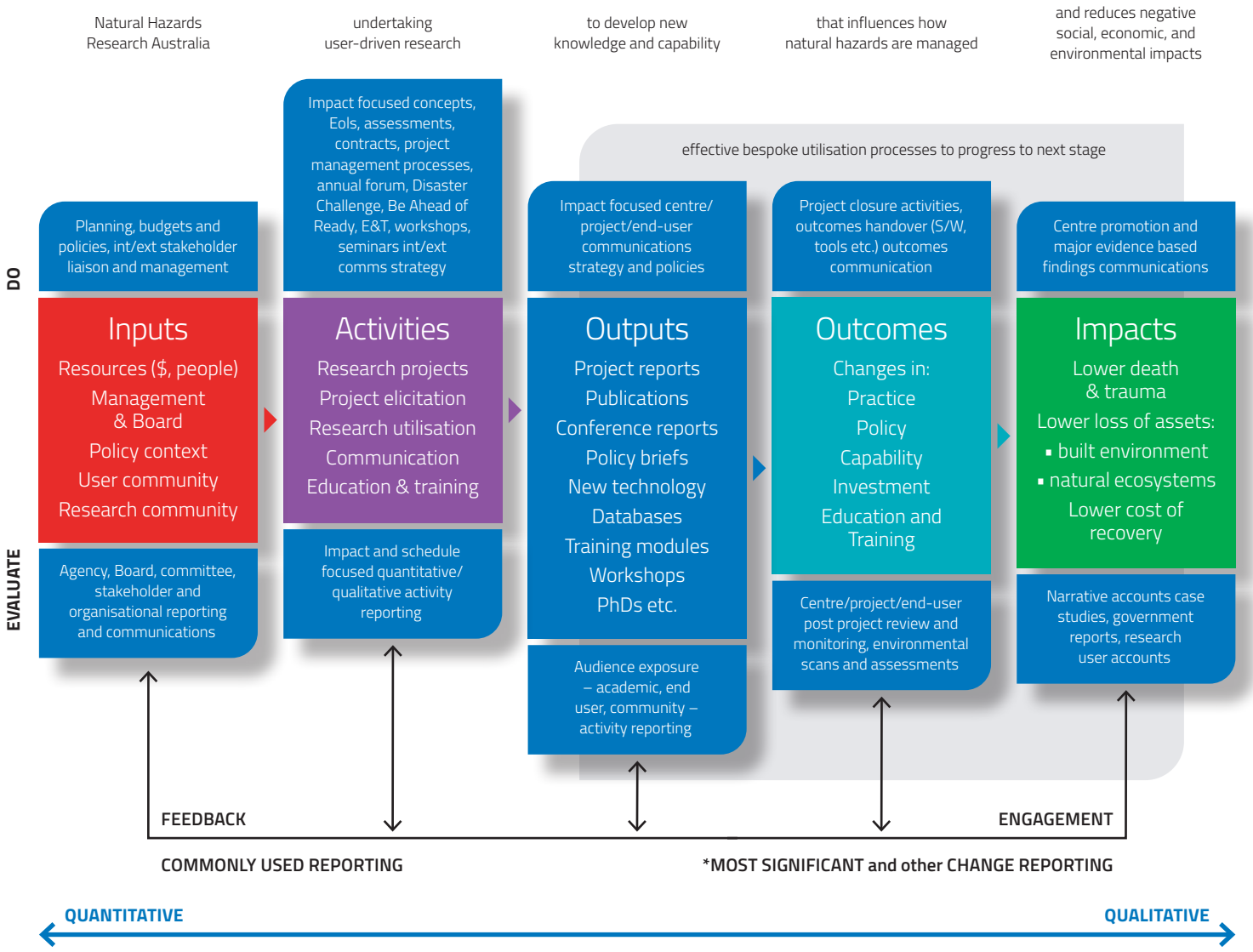

Figure 3: Monitoring and evaluation program logic

Education program

The Education program has two components: the Postgraduate Research Scholarship program and the Associate Student program. This program is governed through the Centre's Education and Training Committee.

Postgraduate Research Scholarship program

The Postgraduate Research Scholarship program accepts applications annually from students enrolled in PhD and Masters by Research Degrees, and opens on 1 July each year. Applications will continue to be accepted until all scholarship funds for that year have been allocated.

Scholarship applications are required to align with the identified research priorities or emerging issues identified by the Centre, and will be assessed based on:

- the student's alignment to the Centre's research themes
- the potential for the student projects to contribute to the Centre's knowledge
- integration of the student into the learning environment of the host research group.

Opportunities will also be taken to align and, if appropriate, incorporate students within core research projects.

Scholarships will be:

- funded for up to 3.5 years full-time for PhD scholarships, and pro-rata for Masters by Research scholarships (part-time equivalent students are considered)
- full scholarships will be funded at $30,000 per annum
- partial scholarships will be funded at $15,000 per annum.

Scholarship students will be supported to participate in Centre events and scientific conferences.

Scholarship students will be able to:

- apply for a limited number of industry placement opportunities
- participate in other relevant programs from the Centre
- participate in the early career researcher development program

Associate Student program

Students who are conducting research relevant to the Centre and its participants that are not directly funded by the Centre are eligible to apply to be associate students of the Centre.

The Associate Student program offers these students an opportunity to benefit from being more formally affiliated with the Centre and its activities.

Students can apply to the Associate Student program at any time.

Associate students will benefit from the ability to:

- apply for funding support to attend a relevant conference, and to participate in events and activities run by the Centre
- participate in professional development activities offered by the Centre, which may include writing skills, media and public speaking training and poster design
- apply for short-term placements in Centre partner organisations.

Early career researcher development

Completion of a PhD is only the beginning of a researcher's career. The Centre provides opportunities for early career researchers affiliated with the Centre to build their international networks, and to be actively engaged in the Centre's research and professional development programs.

Early Career Researcher Development and Industry Fellowships

These Fellowships recognise the value that can be achieved by supporting early career researchers to expand their research networks, create strong local and international collaborations and to have the opportunity to compare the opportunities and challenges for natural hazards research in different geographic, societal, cultural and climatic settings.

Early Career Researcher Development Fellowships are available to full-time PhD students who have successfully completed the equivalent of two years of full-time study, and PhD-qualified researchers employed in research positions in research institutions or universities, for up to five years after their PhD graduation.

Early Career Researcher Industry Fellowships are available to PhD-qualified researchers employed in industry (where their employer is a participant in the Centre), for up to five years after their PhD graduation.

Fellowships are available for:

- up to $15,000 for Early Career Researcher Development Fellowships
- up to $7,500 for Early Career Researcher Industry Fellowships.

Fellowship holders benefit from a range of additional opportunities, including networking opportunities, mentoring, promotion of research and connection into the Centre's knowledge network.

The Disaster Challenge

The Disaster Challenge is a national challenge to encourage new ideas, new thinking and new research. It is open to early career researchers, postgraduate and undergraduate students in Australia.

The Disaster Challenge invites the best and brightest minds in our universities to put their creative talents into helping us solve the trickiest of social and cultural problems that surround how we deal with wicked problems surrounding floods, bushfires, storms, cyclones and other natural hazards.

A wicked problem is one that is urgent, but difficult to solve because of incomplete, contradictory or changing requirements that are often difficult to recognise or evaluate.

Delivery of the Disaster Challenge will be actively supported by participating universities, in collaboration with end-user stakeholders.

Research-skilled workforce

Research networks

To facilitate engagement with the academic community and to raise Centre participant awareness of current scientific advances, the Centre will be establishing several research networks to align with our programs.

These networks will:

- ensure that our participant organisations are kept up to date on the current state of scientific knowledge in natural hazards
- enhance engagement and communication with our academic stakeholders
- develop a vehicle to link participant organisations with the research community.

Career development

The ultimate success of the Centre's research program will be supported through sustainability of research teams. This will be addressed in a number of ways, including support for career development and succession planning as valued contributions to research projects.

The expectation is that leading research and research expertise will be nurtured and supported, and that this will contribute to a degree of sustainability that will allow supported research teams to develop a team with enough diversity of interests and active collaborations that the groups as a whole can develop reliable funding partnerships beyond the Centre.

Evidence of researcher development and succession planning is included in the merit selection criteria for Centre-funded projects.

Conference and related travel support

There is an expectation that researchers will actively engage with the Centre in workshops and conference presentations relevant to their projects.

Researchers engaged in the Centre's activities can also apply for funding to support their attendance at and participation in national and international conferences and workshops.

Priority for this funding will be given to:

- early career researchers
- researchers experiencing disadvantage
- researchers from under-represented groups.

Work placement program

During the 2023-24 financial year, the Centre will explore several approaches to internship and industry placement programs for researchers with a view to establishment of long-term program operation. This includes the eventual facilitation of sector practitioner placement with university research teams to build their skills and knowledge of the research sector.

Research translation capability

The Centre has an active program to build the understanding and capabilities required to translate research outcomes efficiently and effectively into practice. The Centre will provide opportunities for students, researchers and end-user staff to learn and share their skills in these areas.

This skill development and sharing will be incorporated into:

- student professional development activities
- work placement program
- the Centre's training and education program
- participation by researchers and end-users in project governance groups and in Translation and Implementation Panels
- participation in workshops, symposia and webinars
- opportunities to take on leadership roles in research and in research translation projects.

Commissioned research

The Centre will undertake independently funded, commissioned research that will leverage the research and project management capabilities available through the Centre and its research providers. This research will be aligned with the Centre's objectives and will be fully funded by the entity requesting the research.

The commissioned work of the Centre will add to the accessible knowledge available through the Centre and be linked closely to related research across the Centre and its participants.

For 2023-24, the Centre has formal arrangements in place with two organisations to undertake fully funded commissioned research:

- the Victorian Government's Department of Energy, Environment and Climate Action (DEECA)
- Victoria's Country Fire Authority (CFA)

Other commissioned work is anticipated on an ad-hoc basis.

Research-informed knowledge transfer

Education and training program

Through its partnerships, the Centre will have many opportunities to implement an education and training program that goes beyond the postgraduate training program.

The Centre will, as appropriate, use the knowledge and outcomes from its research program to develop opportunities to:

- deliver educational workshops, seminars and webinars based on research findings and outcomes
- develop training and professional development packages
- provide information that can be used to update and enhance vocational education training packages
- support research organisations to incorporate research findings into accredited undergraduate and graduate higher education programs, including through engagement in student-led industry projects
- support industry-based skills and knowledge development for volunteers and employees pursuing professional development and role accreditation.

There may also be opportunities for the Centre to work with end-users and research-engaged education providers to develop customised accredited and professional development subjects and courses. This will allow the strengths of the Centre's education and training participants to work with end-users to develop and deliver targeted education and training programs.

Knowledge diffusion and transfer

Beyond the education and training initiatives, the Centre's core engagement strategies will have a significant focus on end-user engagement and the translation and adoption/implementation of research outcomes into practice.

This will include:

- an annual Natural Hazards Research Forum
- research and utilisation workshops across the country
- subject matter workshops, symposia and webinars
- an outreach program that makes the science accessible to all participants and the community through research briefing notes, online resources, demonstration videos, podcasts, media engagement and other means.

References

Throughout this document there are references to several of the Centre's overarching documents, as well as publications by other entities.

The most current version of each Centre publication can be found on the Corporate Documents page of the Centre's website: www.naturalhazards.com.au/about-us/corporate-documents

The following links are provided to specific publications:

- Commonwealth of Australia (2018) *National Disaster Risk Reduction Framework*: https://www.homeaffairs.gov.au/emergency/files/national-disaster-risk-reduction-framework.pdf
- Commonwealth of Australia (2021) *Australia State of the Environment report:* https://soe.dcceew.gov.au/
- Natural Hazards Research Australia (2022) *Strategic Plan 2021–2031*: www.naturalhazards.com.au/sites/default/files/2022-05/NatHazResAus%20StratPlan%20FA02.pdf
- Natural Hazards Research Australia (2022) *10-Year Research Strategy 2022*: www.naturalhazards.com.au/sites/default/files/2022-05/NatHazResAus%2010yr%20Research%20Strategy%20FA01.pdf
- Natural Hazards Research Australia (2022) *Research Data Management Framework*: www.naturalhazards.com.au/sites/default/files/2022-05/NatHazResAus%20Data%20Management%20Framework.pdf
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Attachment 1:

Consolidated milestones 2023–24

Date	Milestone description	Targeted outcome
	Centre research priorities	
30 June 2024	Biennial Research Plan 2024-26 drafted and endorsed by Centre Board.	Approved
30 June 2024	All funded research complying with the Centre's research data framework. Online data catalogue is available, populated and utilised.	Complete
	Learning from disasters	
30 June 2024	Outcomes, findings and insights from post-disaster research projects shared in a timely manner.	As required
	Engaging with other research initiatives	
30 June 2024	The Centre engages with relevant national and international research initiatives.	Represented
	Research portfolio	
31 December 2023	October 2023 research project investment round complete and approved by the Centre's Board.	Complete
31 December 2023	Research projects approved for development before 30 June 2023 awarded by 31 December 2023.	Projects awarded
31 January 2024	Research projects to be mapped into programs of work with a clear narrative. Programs governed by Translation and Implementation Panels and supported by research networks (where practicable).	Complete
30 June 2024	Research projects approved for development before 31 December 2023 awarded by 30 June 2024.	Projects awarded
30 June 2024	April 2024 research project investment round complete and approved by the Centre's Board.	Complete
	Translation and implementation	
31 January 2024	Monitoring and evaluation framework implemented to provide systematic demonstration of the Centre's impact.	Complete
	Education program	
30 June 2024	Scholarship and work placement programs integrated into end-user driven core research program and contribute to research impact.	Complete
30 June 2024	Award of at least one scholarship to a First Nations recipient.	Complete
	Early Career Researcher program	
30 June 2024	Early Career Researcher Fellowships awarded.	Two
30 June 2024	Disaster Challenge held.	Complete
30 June 2024	Research network established.	One
	Research-skilled workforce	
30 June 2024	Opportunities to utilise research through education and training programs in consultation with participants and stakeholders are identified.	Achieved
	Knowledge transfer	
30 June 2024	Annual Natural Hazards Research Forum delivered.	Complete
30 June 2024	Regular series of research translation and engagement events delivered with high participation and positive feedback, for example, workshops and webinars.	10

Find supporting research documents and the portfolio of projects on our website
www.naturalhazards.com.au