

Biennial Research Plan 2024–26

Natural Hazards Research Australia



Australian Government

Natural Hazards Research Australia's staff work from Burrumattagal, 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 predeeding Cooperative Research Centres, the Bushfire CRC and the Bushfire and Natural Hazards CRC.

The Centre undertakes user-driven multi-disciplinary research that promotes resilience to the impacts of natural hazards¹ 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 informs national and regional policy, capability and improved 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 2024–26* outlines the Centre's research activities and how they will deliver the outcomes outlined in the Centre's *10-Year Research Strategy 2022* and *Strategic Plan 2021–2031* (see References).

This plan provides an outline of the Centre's research activities; provides a framing for the Centre's research investments to provide for the Centre's research portfolio of projects; and describes the Centre's targeted milestones. It provides a two-year outlook that will be reviewed in 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 associated influencing factors were developed in consultation with end-users and research organisations.

The Centre continues to engage with its Participants to ensure its research program is driven by and meets the needs of government, emergency services, industry and the community to maximise relevance and value. User driven investment rounds are open to Centre Participants, or those end-users approved by the Centre's Board to submit research project ideas for funding.

Context

Australia is susceptible to a diverse range of natural hazards. The 2023–24 high risk weather season saw damaging natural hazard events nationwide including floods, severe storms, cyclones, bushfires and heatwaves. These events occurred within the context of record global temperatures, with 2023 being the warmest year recorded globally. Many communities impacted were still recovering from previous recent natural hazard events and the ongoing impacts of the COVID-19 pandemic.

Overall, the financial costs of natural hazards continue to grow, placing greater pressures on the resilience and sustainability of communities. Rising insurance prices linked to natural hazard losses are contributing to the increased cost of living across Australia. Natural hazard emergencies are expected to become more frequent, complex, unpredictable and difficult to manage.

Drivers that influence natural hazards

Several drivers influence natural hazards and associated vulnerability, exposure and sector and community 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
 - ageing population
 - increases in social isolation with more people living alone
 - increased use of digital devices and the internet
 - housing shortages placing pressure for further development
 - migration of people into areas where they are not aware of natural hazard risks
 - 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 lithium-ion batteries, hydrogen, electric vehicles, etc. and decentralised energy systems such as microgrids
- ageing infrastructure impacting the reliability of services
- growing demand for nature positive investments
- increases in population necessitating commensurate growth in building stock
- increasing use of highly flammable and combustible materials

→ capability change, inclusive of:

- technological change, including the potential of quantum computing
- widespread adoption of artificial intelligence (AI)
- next-generation communications (for example, 5G and satellite)
- sensors and growth in their deployment (including satellite technologies)
- robotics
- augmented reality
- digital twins
- hypersonic transport
- autonomous vehicles
- next generation building materials
- increasing appreciation of First Nations management practices

→ workforce trends, inclusive of:

- declining rates of formal volunteering
- increasing workforce diversity
- increasing flexible working

- political, regulatory and economic change, inclusive of:
 - the impact of the global economy on Australia's economic circumstances
 - geo-political stressors
 - growing risk of cyber attacks
 - increases in Australians' wealth
 - rising insurance premiums. The House of Representatives Standing Committee on Economics is currently conducting an inquiry into insurers' responses to major flood claims in 2022, including consideration of insurance affordability
 - legislated Nature Repair Market
 - climate and nature disclosures

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 and resilience investments
- 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 investment 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 infrastructure resilience be enhanced to reduce community disruption?
- How can construction standards include resilience and future risk considerations?
- How much mitigation investment is required? What are the highest priority risks? Where are these 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 be better empowered to strengthen and protect landscapes and communities?

Australian Government plans

In 2023 the National Emergency Management Agency (NEMA) released the *Second National Action Plan* to implement the *National Disaster Risk Reduction Framework*. The aim of the plan is to reduce systemic disaster risk in order to create stronger, more secure and more resilient communities before, during and after disasters. It is essential that the work of the Centre aligns with this plan and contribute to its objectives. Pleasingly mapping against each of the plan's 24 national actions demonstrates the Centre's contributions across each of these.

The Australian Government is undertaking a national climate change risk assessment which will inform the development of a national adaptation plan. The adaptation plan is to be delivered by late 2024 and will provide guidance on how Australia will adapt to climate risk, scale up adaptation efforts and build national resilience to climate impacts.



The Centre's research priorities for 2024–26

Based on an environmental scan of current risk, capability and policy trends (including themes from recent reviews and inquiries) and feedback from participants and other subject matter experts, the Centre proposes a series of research focus and key capability areas. The Centre encourages foresight and innovation across these areas with the view of leading research which will be useful, useable and used.

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 [attachment 2](#)).

These research focus and capability areas act as a prospectus to guide the submission of user-driven research concepts via the Centre's investment processes. The purpose of research questions listed under each focus and capability area is to provide examples to illustrate the types of research that would be considered relevant to each focus and capability area.

2024–26 research focus areas

Understanding and mitigating risk

The *National Disaster Risk Reduction Framework* and its supporting *Second National Action Plan* focuses the nation's attention on building resilience by reducing risk, including through the ability to resist, accommodate, adapt to, transform and recover from the impacts of hazards. 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 in consultation with stakeholders including Natural Hazards Research Australia.

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

- What are the true costs of natural hazards now and in the future?
- What are the drivers and science of current and 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 and will effectiveness change under future climate change?

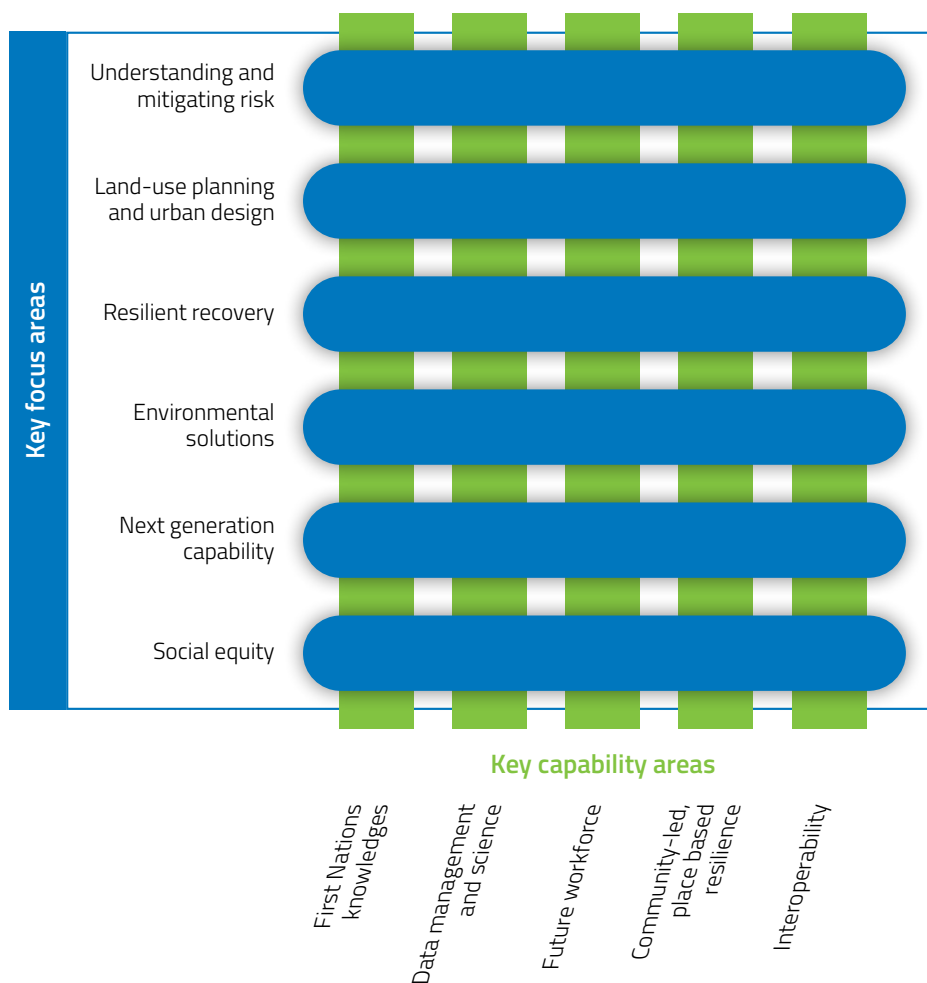


Figure 1: Key focus and capability areas

- How can investment in natural hazard mitigation be encouraged?
- How can governance arrangements enable disaster risk reduction?
- How can hazard treatments be managed to minimise impact on environmental, cultural and historical assets?

Land-use planning and urban design

Land-use planning and urban design (inclusive of building materials) are critical to the reduction of future natural hazard risk. Recent floods and bushfires highlight opportunities to consider developments in high-risk areas. National Cabinet has tasked planning ministers to develop national standards for the incorporation of disaster and climate risk, as part of land-use planning and building reform processes. The Senate Select Committee on Australia's Disaster Resilience recently recommended a parliamentary inquiry be established into land use planning with respect to disaster resilience.

Industry has called for further government consideration of land use planning systems assisted relocation strategies and reforms to building codes.

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

- How effective are existing land-use planning and urban design controls at managing current and future natural hazard risk?
- How do we best accommodate current and future natural hazard risk, societal changes and resilience considerations in land-use planning and urban design in an affordable way? (i.e. What are the land use planning and urban design controls required today for tomorrow?)
- How can risk-informed planning be encouraged and supported?
- How should essential infrastructure be managed to ensure resilience?

- How can physical risks associated with energy transition (e.g. lithium-ion batteries) and evolving urban design be managed?
- How can future building materials enhance asset resilience?

Resilient recovery

Recovery from disasters caused by 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.

In communities experiencing compound and cascading natural hazard events, there is a sense that recovery never ends. There is a need for collaborative research into the systemic changes needed to build resilience.

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

- What is the effectiveness of recovery practices?
- What systemic change is needed to build resilience?
- How are communities best rebuilt and transformed during recovery to build resilience and reduce natural hazard risk?

Environmental solutions

The Commonwealth Government's *Australia State of the Environment 2021* report highlighted the significant risks 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 are the opportunities to deploy nature-based solutions?
- What is the efficacy of nature-based solutions to reduce natural hazard risk?
- How can nature-based 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 changes?
- 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 that considers 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 (e.g. aerial firefighting)? How are they best optimised?
- What are the requirements for the next generation of emergency management capability and how is this built?
- How can new technologies such as AI, augmented reality and robotics be adopted and deployed to improve resilience?
- How can better decision making be enabled for first responders and community members?

- How can predictive risk simulation, decision-support and communication be enhanced?
- What is the next generation of warning systems?
- How can first-responders be more effectively protected?
- How can resilience to technological disruption be maximised?

The Centre also welcomes opportunities to engage in technology demonstration research.

Social equity

Natural hazard risk is underpinned by vulnerabilities including social vulnerabilities such as impediments to 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 focus area 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? For example, First Nations, people with disability and culturally and linguistically 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?
- What specific attributes of social capital contribute most significantly to community resilience?

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

What is the enabling environment that will better embrace First Nations knowledge to build resilience and heal and manage land, while recognising the importance of First Nations peoples' involvement in disaster management?

The completion of the Centre's *REFLECT Reconciliation Action Plan* (RAP; see References) strengthened the Centre's connections and partnerships with First Nations peoples across the natural hazard research sector, and has guided 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. This will be supported by a First Nations Research Strategy.

Data management and science

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

There is significant emerging interest from Centre participants to understand emerging data and the application of AI to disaster resilience and risk reduction, including its limitations and ethical considerations.

The Centre developed a *Research Data Management Framework* (see References) to guide the Centre's research data management. This framework focuses on data collection, identification, collation, curation, access and sector leadership.

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

The Centre will collaborate with others where opportunities exist to maximise value.

Future workforce

As the nature of natural hazards, technology and society evolves, so too must the future workforce.

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

- What does the nature of the workforce look like in 2040?
- What strategies can be implemented to attract new recruits into disaster resilience and risk reduction, and retain them over the long-term?
- How can volunteering be encouraged amongst diverse communities and how will volunteering differ between rural and urban areas?
- How can workforce health and safety be enhanced? How will strategies differ between volunteer and career workforces?

Community-led, place-based resilience

Community-led initiatives for adaptation, preparedness, response and recovery are critical for disaster resilience and risk reduction.

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

- What expectations do communities have of emergency management and government agencies and what do they need? How can collaboration with communities be enhanced to achieve shared responsibility and accountability and recognise community-led approaches?
- How can community-led, place-based response capability be increased? How can behaviour change techniques be applied?

- What are the most effective approaches to community engagement, including in preparing for risks they previously experienced?
- What is the best way to measure the effectiveness of community engagement and resilience programs?
- What is the state of disaster preparedness nationally?
- What are community expectations of public information and warnings?

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 Warning System
- National Heatwave Warning Service
- Australian Fire Danger Ratings System
- Fire simulation/fire prediction systems
- Aerial firefighting
- Extreme weather impact prediction
- Critical communications capabilities

Opportunistic and responsive activities

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

- by research users 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; and
- to promote the utilisation of the Centre's research.

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.

Foresight, innovation and thought leadership

The Centre is responsive to the needs of end-users but also has an important role in stretching thinking in areas of emerging importance, innovation and policy relevance. Centre Participants have a desire to better understand the influence of future technologies and policy trends. The Centre invests in thought leadership papers and events in partnership with Participants, industry stakeholders and researchers to drive future thinking, innovation and research.

Research utilisation

To focus the Centre's research in delivering utilisation outcomes:

- research will be end-user led
- utilisation objectives will be clearly defined at the initiation of all projects and monitored throughout the project
- projects will be undertaken by researchers in collaboration with end-users to build relationships that enable knowledge transfer and translation
- research will be communicated using multiple tailored methods (see later sections)
- successful research utilisation will be promoted

Current research portfolio

The Centre's current research projects are listed in [Attachment 3](#). Further details of these projects, including project outputs are regularly updated on the Centre's website.

Updating the Centre's research priorities for 2025-27

The Centre's research priorities for 2025-27 will be developed and incorporated into the Centre's *Biennial Research Plan 2025-27*.

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 the use of post-disaster research to gain insights that can make a significant contribution 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 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:

- Post Disaster Research Program available to the Centre's end-user Participants
- Quick Response Program available to researchers for the 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.

Post-Disaster Research Program

The Post-Disaster Research Program (PDRP) enables the Centre to actively engage with its Participants to identify essential research needed following a disaster caused by natural hazards. This could be through projects established by the Centre or through co-investment with Participants or industry stakeholders.

The PDRP will 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.

The Centre will prioritise funding to projects with benefits to multiple jurisdictions; supports the directions outlined in this plan; identifies a clear critical research need or gap in knowledge and/or practice; and likely result in utilised outputs that enhance safety, resilience or sustainability of communities in the context of natural hazards.

Quick Response Program

The Quick Response Program (QRP) provides funding for research data collection and can be used to directly support researchers for out-of-pocket expenses, including travel to disaster-affected areas to collect time-critical, perishable data² following disasters caused by natural hazards.

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

From findings to learnings

To receive the benefits of projects supported through the PDRP 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 data collected through this program be made available to the Centre and made publicly available in line with the principles outlined in the Centre's *Research Data Management Framework*, to ensure contribution to the national natural hazards data and knowledge collection.

This will contribute to building national datasets and identifying significant insights and research questions arising from major natural hazards, providing a context for the development of more extensive research proposals and influence of research priorities.

The Centre is developing 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, with more likely to appear over time.

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

In addition, several research collectives and initiatives in the university sector are undertaking research relevant to the Centre's strategic aims (e.g. the Queensland Disaster Research Alliance).

Collaboration options include:

- participation in governance arrangements and working groups
- shared workshops and events

Maintaining a dynamic research portfolio

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

The Centre has already committed some \$21 million in funding to its end-user driven core research portfolio.

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

The ongoing research portfolio is developed and managed through strong engagement with 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, two formal end-user driven investment rounds will take place each financial year (assessed in October and April). Each round's funding round will be agreed by the Centre's Board.

Based on analysis of the Centre's research portfolio, specific themes may be assigned to individual rounds. As the research portfolio matures opportunities will arise to further the utilisation of Centre's research including projects undertaken by the previous Bushfire and Natural Hazards Cooperative Research Centre.

Development of new projects

The Centre's processes are designed to answer research questions posed by the Centre's end-users.

User-driven investment rounds are open to Centre Participants, or end-users approved by the Centre's Board. Project ideas are evaluated using a published set of criteria and reviewed by the Research and Implementation Committee, before being endorsed by the Centre's Board.

Once projects are approved, researchers are onboarded (consistent with the Centre's policies) and an inception process of collaborative co-design is completed through the development of a project plan endorsed by a governing project management committee consisting of end-user, researcher and Centre representatives.

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

These processes ensure a shared understanding of desired research outcomes and project governance.

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

Ultimately, the aim of these structures is to ensure research is undertaken in a collaborative manner to meet the outcomes desired by the Centre's end-users.

Translation, implementation and adoption of research outcomes

Research project outcomes will be clearly monitored and evaluated continuously to ensure research is adopted and utilised by end-user Participants via the Centre's evaluation framework.

This process will focus on:

- translation (demonstrating project outcomes are fit for implementation);
- implementation (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 oversight and review of 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, with formalised Participant engagement and agreed adoption/utilisation pathways through the development of clear implementation and adoption strategies.

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

Given the extended timeframes that are often required between the start of a research project and implementation of the outcomes and demonstration of adoption benefits, the Centre is developing a multi-pronged approach to identify, capture and record progress of projects, and the direct and indirect benefits of the implementation and adoption of research deliverables and other research outcomes.

The development of monitoring and evaluation approaches aims to:

1. develop methods and processes that are fit for purpose;
2. apply these methods and processes across the five elements of standard program logic (Figure 2 – from planning inputs to output impacts);
3. utilise available and potential data sources on a continuing basis; and
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 aims that underpin the Centre's research.

The monitoring and evaluation program logic is outlined in Figure 2.



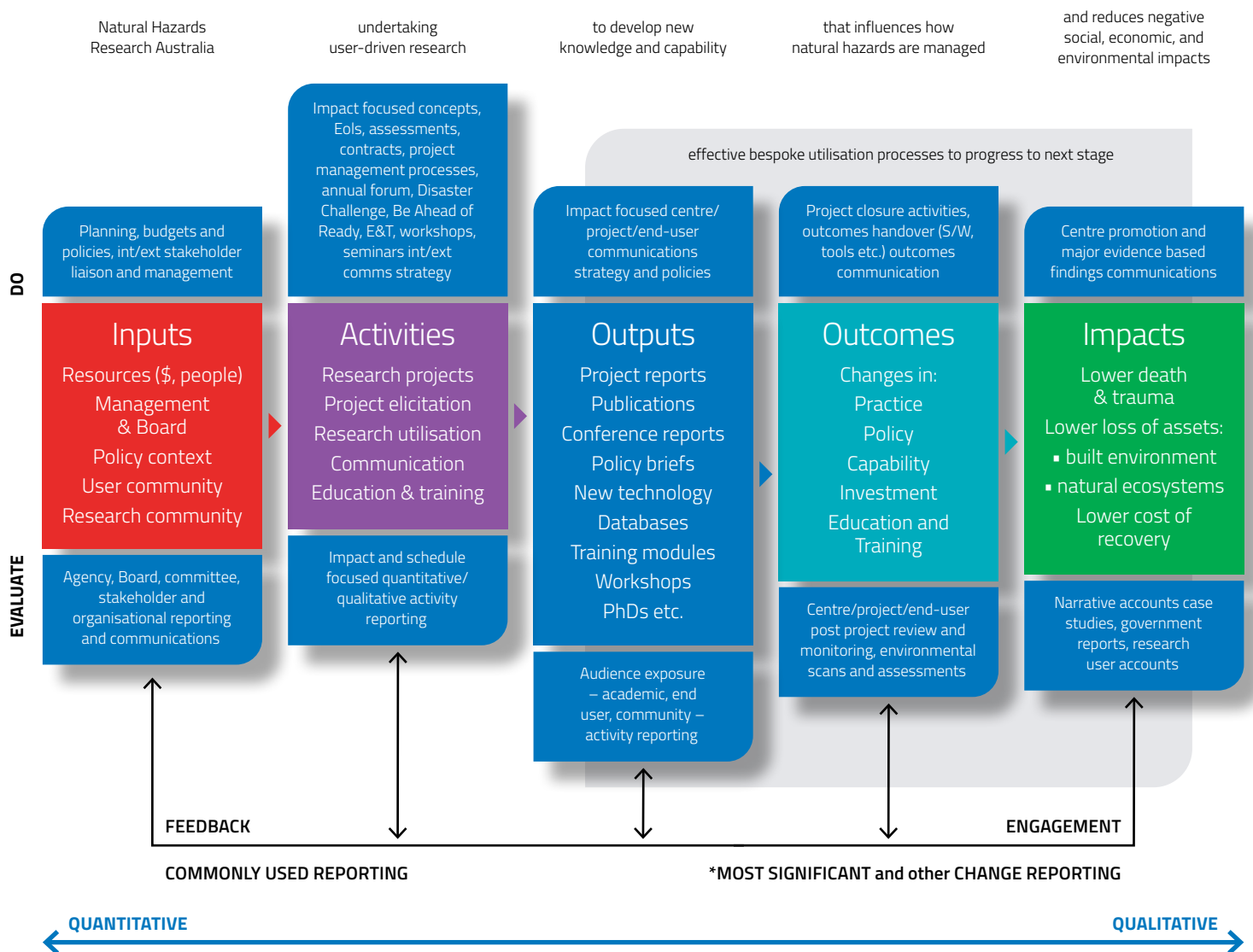


Figure 2: Monitoring and evaluation program logic

Education program

The Education program comprises 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 from students enrolled in PhD and Masters by Research Degrees and opens 1 July each year. Applications are accepted until the annual scholarship fund is fully allocated.

Scholarship applications are required to align with 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's project to contribute to the Centre's knowledge base
- The 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 the Centre's 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 funded at \$33,000 per annum
- partial scholarships funded at \$16,500 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 Centre programs
- participate in the early career researcher development programs

The Centre is working to implement a specific scholarship for a First Nations candidate.

Associate Student program

Students conducting research relevant to the Centre and its Participants that are not directly funded by the Centre are eligible to apply to be Associate Student.

The Associate Student program offers these students an opportunity to benefit from formal affiliation 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 in supporting early career researchers to expand their research networks, create strong local and international collaborations and compare the opportunities and challenges for natural hazards research in different geographic, societal, cultural and climatic settings.

In 2024-25 Fellowship criteria will be reviewed to encourage further involvement in the program by First Nations people.

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 Centre Participant), 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

Fellows will 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 universities to put their creative talents into helping solve the trickiest social and cultural factors that impact how wicked problems are dealt with surrounding floods, bushfires, storms, cyclones and other natural hazards.

A wicked problem 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 raise Centre Participant awareness of current scientific advances, the Centre will continue to establish research networks that align with its programs.

These networks:

- ensure that Participant organisations are kept up to date on the current state of scientific knowledge in natural hazards;
- enhance engagement and communication with academic stakeholders;
- develop a vehicle to link Participant organisations with the research community; and
- aid the professional development of Participants

Career development

The ultimate success of the Centre's research program will be supported through the 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.

Conference and related travel support

There is an expectation that researchers will actively engage with the Centre through 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 2024-25 financial year, the Centre will explore approaches to expand its internship and industry placement programs for researchers and practitioners.

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 through:

- student professional development activities
- work placement programs
- 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.

In 2024-25, 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 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 (virtual and online)
- subject matter workshops, symposia and webinars
- an outreach program that makes the science accessible to all Participants and the community members through research briefing notes, online resources, demonstration videos, podcasts, media engagement and other channels



References

This plan references several of the Centre’s overarching documents, as well as publications by other entities.

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

The following are links to specific publications referenced:

- 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: <https://soe.dceew.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
- Natural Hazards Research Australia (2022) *National research priorities for disaster risk reduction and community resilience to the impacts of natural hazards*: www.naturalhazards.com.au/sites/default/files/2022-05/NatHazResAus%20ResearchPriorities%20FA02.pdf
- Natural Hazards Research Australia (2022) *REFLECT Reconciliation Action Plan*: www.naturalhazards.com.au/sites/default/files/2022-09/NHRA%20REFLECT%20Reconciliation%20Action%20Plan_final.pdf
- United Nations Office for Disaster Risk Reduction (2015) *Sendai Framework for Disaster Risk Reduction 2015–2030*: <https://www.undrr.org/publication/sendai-framework-disaster-risk-reduction-2015-2030>

Attachments

Attachment 1

Milestones 2024–25

Attachment 2

Relationship between 2024–26 research focus areas and Centre research themes

Attachment 3

Current portfolio

Core research projects

Postgraduate student projects

Associate student projects

To download the attachments head to

naturalhazards.com.au/brp2426-attachments



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