Natural Hazards Research Australia

Biennial Research Plan 2022–24

Natural Hazards Research Australia

Australian Government

Natural Hazards Research Australia's staff work from Wurundjeri, Yuggera, Wangal, Tharawal, Wadawurrung and Dja Dja Wurrung Country. 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 currently developing a Reconciliation Action Plan to strengthen our reconciliation with First Nations peoples and communities.

Publisher: Natural Hazards Research Australia

July 2022

Citation: Natural Hazards Research Australia (2022) *Biennial Research Plan 2022–24*, accessible at www.naturalhazards.com.au/about-us/corporate-documents.

To contact Natural Hazards Research Australia, email office@naturalhazards.com.au.

The Centre's research strategy

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 Cooperative Research Centres, the Bushfire CRC and the Bushfire and Natural Hazards CRC.

The Centre undertakes research that will promote resilience to the impacts of natural hazards[1] and reduce 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 will be 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* and the *National research priorities for disaster risk reduction and community resilience to the impacts of natural hazards* (2022).

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. Natural hazards highlighted by the Australian Government under the funding agreement for the Centre are bushfire, flood, cyclone, heatwave, storm, inundation and erosion caused by sea level rise, earthquake, tsunami and landslide.

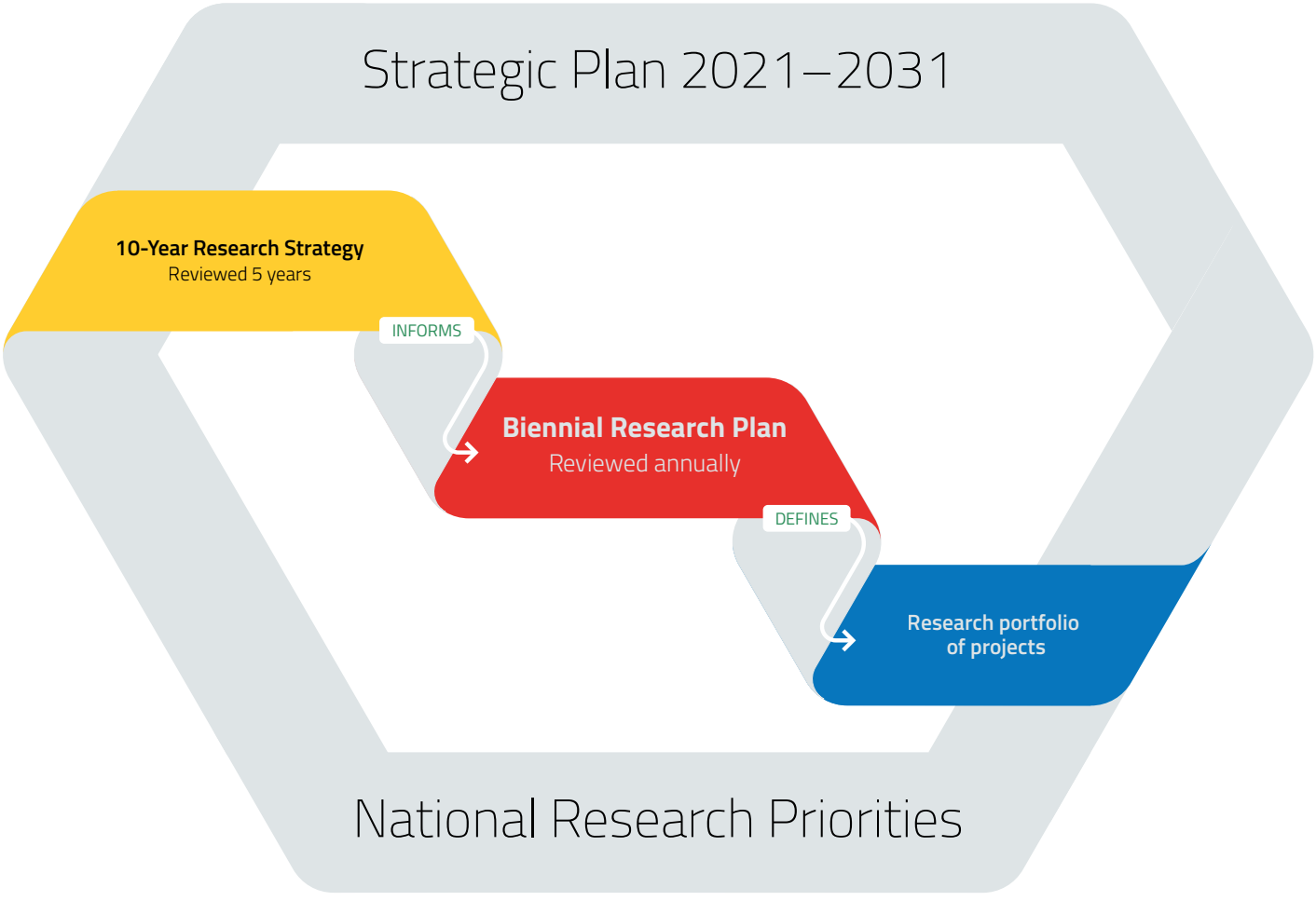
Purpose and framing of Biennial Research Plans

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

Biennial Research Plans will outline the Centre's specific research activities and how they will deliver the outcomes described in the Centre's *10-Year Research Strategy* and the *Strategic Plan 2021–2031*.

Effectively, Biennial Research Plans will provide an operational guide for the Centre's research activities. The plan provides a two-year outlook and will be reviewed on a 12-month cycle – to retain the two-year outlook.

Annual reviews ensure that the Centre is responding to new knowledge needs, based on unfolding natural hazards, impacts on our changing climate and other changes that affect our risks, vulnerability or resilience to natural hazards.



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*:

1. Sustainable, safe and healthy landscapes in a changing environment
2. Situational awareness
3. Operational response and innovation
4. Resilient and sustainable built environments
5. Resilient communities
6. Evidence-informed policy and strategy
7. Workforce and communities of the future
8. Learning from disasters

These themes and the associated influencing factors have been developed through an initial consultation with end-users and research organisations and finalised through stakeholder consultations.

Substantively, that consultation confirmed that the research themes were appropriate for the Centre and identified areas of research and potential projects within those theme areas. It was also acknowledged that there are strong links between many of the themes. It is envisaged that once the Centre's partners have been confirmed, the Centre will engage with the appropriate end-users identified by those partners to further refine the proposed program and projects to maximise relevance and value.

Influencing factors

Significant broadscale risks will be considered when framing research projects. These risks are variables that will inevitably influence the context of research benefit and delivery.

It is anticipated that many of the variables (for example climate change) will influence multiple hazard programs.

These factors are described in more detail in the *10-Year Research Strategy* and are summarised as:

1. climate change
2. demographics and demographic change
3. building regulations
4. land-use planning
5. community activities and behaviours
6. capacity, capability and resourcing in regional areas
7. catastrophic, cascading, concurrent and repeating events
8. reliable access to critical infrastructure and services
9. political will
10. financial influences
11. regulation
12. technological evolution and revolution
13. capacity for organisational change
14. research, and research translation capacity and capability
15. ecosystem services.

The Centre's research focus

Based on the information we received through workshops, written feedback and other discussions, the Centre's research focus is based around the concepts of 'research programs' – where those programs will deliver significant benefits, as well as retain the flexibility to respond to the needs of the Centre's end-users.

The Centre's research focus for 2022–23 was finalised following the development of the *National research priorities for disaster risk reduction and community resilience to the impacts of natural hazards* (2022).

2022–23 research focus

Dynamic building damage and repair modelling

Understanding the dynamics of residential buildings and the communities that live in, and depend on them for their lives and livelihood.

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

- modelling the damage and repair lifecycle of residential dwellings, to understand tipping points (when do the number of damaged dwellings exceed the rate at which they can be repaired) and the levers that can be applied to accelerate or delay the rate of repair or replacement
- understanding how retrofitting and other mitigation activities can change the natural hazard damage lifecycle
- understanding the impacts of delayed repair on social disadvantage and community resilience.

Dynamic situational awareness

Building skills, data and tools to assist in sense-making in complex, uncertain and rapidly evolving environments.

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

- developing dynamic access to situational awareness information
- creating effective was of sharing dynamic information
- improving communication approaches and strategies for sharing trusted information that drives positive actions across multiple users of that information.

Natural hazard-focused risk management and risk reduction

Reducing risks to or from the landscape (for bushfire, flood, storm, cyclone, and other relevant natural hazards).

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

- interface risks between the built and natural environments
- understanding and protecting First Nations and cultural values

Operations, incident management and decision-making in a dynamic and uncertain environment

Improving the way that incident management operations are conducted in high stress, uncertain and rapidly evolving environments.

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

- developing the next generations of incident managers and incident controllers
- improving how we make effective decisions in complex situations where information is incomplete, providing conflicting perspectives and rapidly evolving.

Responsive recovery

Developing, extending and evaluating approaches for community-led recovery.

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

- developing integrated models for increasing resilience that specifically reduces the extent or duration of recovery activities or improves the outcomes of recovery activities.

Understanding the needs and values of current and future communities through a natural hazard lens

Understanding and influencing drivers of positive behaviours by people, communities. Including risk acceptance, willingness to pay, and willingness to make trade-offs.

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

- understanding how communities and community values are likely to evolve by 2030.

Strengthening and preservation of business and community lifelines

Reliance on critical infrastructure and essential services are key vulnerabilities globally.

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

- asking what we can and should be doing now to minimise reliance on these lifelines or build their resilience to massive simultaneous impacts in one or more locations.

Ongoing priorities across the Centre's activities

In addition to the specific 2022–23 focus outlined above, the following priorities will be a long-term commitment from the Centre.

In many cases, these will be embedded in many, if not all, of the research projects funded or supported by the Centre.

Opportunistic and responsive activities

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

- by Centre participants in response to a significant emerging needs
- to respond to significant disasters, or new natural hazard risks, as they occur.

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.

Future workforce

People remain an essential element in the success of disaster risk reduction and disaster resilience-strengthening initiatives. For the Centre's end-users, these people are their workforces.

Where appropriate, the implications, considerations and opportunities for current and future workforces will be incorporated into project design and deliverables.

This includes understanding the education and training required to prepare staff and volunteers to operate in future environments.

Effective data management

The Centre has developed a *Research Data Management Framework* that focuses on data collection, identification, collation, curation, access and sector leadership.

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

Support to national systems and capabilities

In developing the *National research priorities for disaster risk reduction and community resilience to the impacts of natural hazards* (2022), several national systems and capabilities were identified that were informed by research and would benefit from ongoing contributions from research.

Whilst some of these systems have developed research capabilities to support them (for example, many of the products in the Bureau of Meteorology and Geoscience Australia), others do not have any identifiable formal research support programs in place. For these latter systems and capabilities, and where practical and with the support of the Centre's end-users, relevant research projects will incorporate linkages to relevant systems and capabilities in their project deliverables.

Systems and capabilities with identified research needs identified as an important focus in this Biennial Research Plan are:

- Australian Fire Danger Ratings System
- Fire simulation and prediction systems (e.g. Spark, Phoenix)
- aerial firefighting
- extreme weather impact prediction.

Updating the Centre's research focus for 2023–24

The Centre's research focus for 2023–24 will be developed and incorporated into the Centre's Biennial Research Plan 2023–25. This update to the Biennial 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 end-users and researchers, recent natural hazard events and relevant inquiries and after-action reviews.

Learning from disasters

Given the complex nature of disasters caused by natural hazards, post-disaster research can help gain insights that will make significant contributions to disaster risk reduction and strengthening of disaster resilience.

As such, *Learning from disasters* is one of the Centre's key research themes.

The Centre's rolling investment strategy will allow the flexibility to initiate, or to co-invest in, projects in direct response to natural hazard events and other changes that affect vulnerability, exposure or resilience.

Funding to address time-critical, post-disaster research will be available through two research streams:

- Quick Response Fund for researchers completing immediate collection of perishable data
- Responsive Disaster Research for the Centre's end-user partners completing research in the wake of a disaster

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

Quick Response Fund

The Quick Response Fund 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 hazard events.

The Quick Response Fund will be used to gain an understanding of the impacts of a disaster event, by capturing perishable data.

Responsive Disaster Research

Responsive Disaster Research will enable the Centre to engage actively with its end-user partners 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 end-user partners.

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

This research will have a standing contingency allocation in the research program budget.

From findings to learnings

To receive the benefits of projects supported through the Quick Response Fund and Responsive Disaster Research, the Centre will work with the research teams and relevant end-users following the completion of each project, to communicate and share the learnings in the most appropriate ways.

Open access data

The Centre requires that data collected through this program is 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 signi cant 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 data accessibility.

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

This work will be done in collaboration with relevant partners and infrastructure owners and will link where possible with other domestic and national initiatives.

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 event, 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.

Key end-user initiatives in development include:

- NSW Bushfire and Natural Hazards Research Centre
- Qld Disaster Resilience Institute
- WA Bushfire Centre of Excellence.

The Centre is actively engaging with each of these Centres as they are developed and expects to continue that engagement once these centres are established.

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

Collaboration options being explored with all relevant research initiatives 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 annual research focus (outlined in this and future updates of the Centre's Biennial Research Plans) that balances the research investment across the Centre's research themes.

The research portfolio includes an appropriate mix of short-term (tactical), medium-term (applied) and long-term (strategic) projects, based on annual guidance received from the Centre's Board.

The ongoing research portfolio is being developed and managed through strong engagement with our end-users, guidance from our research partners and leadership from the Centre.

The portfolio is actively influenced by the Centre's annual research focus, as detailed in the Biennial Research Plans, which have been developed in consideration of:

- recent natural hazard events and findings and recommendations arising from related inquiries (including the Royal Commission into National Natural Disaster Arrangements)
- technological developments
- jurisdictional and sector needs and priorities.

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

Using a rolling three-year window, the anticipated split of research projects across the short-, medium – and long-term projects is expected to broadly fall in the following categories:

Project category	Typical time frame	Portfolio allocation (by $ amount)[3]
Tactical	<1 year	15–25%
Applied	1–3 years	40–50%
Strategic	3–10 years	20–40%

In the 2022–23 financial year, the Centre will move from the establishment phase into business as usual. At any point in time, there will be a combination of project ideas in development, projects being contracted, projects being conducted and projects in implementation phase.

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 at least annually by the Research and Implementation Committee.

The Centre's active research portfolio

The Centre's current research projects (as of 1 July 2022) are listed in Attachment 1.

3 Calculated based on a rolling 3-year average investment in each project category

Translation and implementation of research outcomes

The design and development of all projects will be based on a clear and understood path to translation (demonstrating that the outcomes of the project are fit for purpose) and implementation (uptake by end-users once the translation phase is complete).

This will be overseen through:

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

Monitoring, evaluation and reporting

The Centre's research portfolio will have clear and measurable outcomes (including performance targets where feasible[4]), coupled with formalised end-user engagement and agreed pathways to adoption.

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

These will be captured as:

- **progress:** how well the project is progressing to plan.
- **knowledge sharing:** demonstration of knowledge diffusion and sharing.
- **translation:** evidence that the research outcomes (deliverables and knowledge) can perform in an operational, business operations or policy environment.
- **implementation:** uptake by one or more end-user groups.
- **value demonstration:** where the performance improvements attributable to the research are demonstrated by the organisation implementing the innovation.

During the 2022–23 financial year, the systems to capture, store, monitor and evaluate the progress and outcome measures listed above will be tested and validated using the Centre's project management system.

Monitoring, evaluation and reporting will be overseen by the Research and Implementation Committee.

4 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.

Postgraduate student research program

The postgraduate research program, governed through the Centre's Education and Training Committee, has two components: the Postgraduate Research Scholarships program and Associate Students program.

Postgraduate Research Scholarships Program

The Postgraduate Research Scholarships 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.

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 will be considered):

- Full scholarships will be funded at $30,000 per year.
- Partial scholarships will be funded at $15,000 per year.

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 partners 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 more formal affiliation with the Centre and its activities.

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

Associate students will benefit from:

- access to travel support for presentations at conferences aligned with the goals of the Centre
- sharing details of the student and their research through the Centre's knowledge network, including on the Centre's website
- access to the Centre's networking and professional development activities, to assist the students to enhance their career prospects.

Early career researcher development

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

Early Career Researcher 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 natural hazards research in different geographic, societal, cultural and climatic settings.

Early Career Researcher Development Fellowships

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

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

The Disaster Challenge

The Disaster Challenge is a national challenge to encourage new ideas, new thinking and new research.

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 floods, bushfires, storms, cyclones, and other natural hazards (wicked problems).

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 Challenges will be actively supported by partner universities, in collaboration with end-user organisations.

More information about the Disaster Challenge can be found at www.disasterchallenge.com.au.

Research-skilled workforce

Sustainable research capabilities

The success of the Centre's research program will partly depend on the sustainability of its research teams.

The expectation is that world-class research and research expertise will be nurtured and sustainably supported. This will allow research teams to develop with enough diversity and active collaboration to create reliable funding partnerships beyond the Centre.

This will be addressed in several ways, including support for career development and succession planning, as valued contributions to research projects. As such, 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 or marginalised groups.

Work placement program

During the 2022–23 financial year, the Centre will develop its work placement program.

The core elements of the program are:

- to provide researchers (including PhD students) with an opportunity to spend up to three months (or longer where it is feasible) based within one of the Centre's end-user organisations, working either on:
  - their own research embedded with their end-users
  - a project jointly developed with the end-user organisation.
- to provide staff from end-user organisations an opportunity to participate in research and research leadership areas. This can include:
  - placements with the research team(s) for relevant projects
  - formal study support to enable enrolment for research higher degrees
  - secondments or placements into the Centre, to learn and share knowledge on the selection, development and management of research programs, and the communication and implementation of research outcomes.

The first placements in this program are expected to become available by 30 June 2023.

Research translation capability

During the 2022–23 financial year, the Centre will develop and pilot an active program to build the understanding and capabilities for efficient translation of research outcomes into practice.

Part of this translation program will be a focus on opportunities for students, researchers and end-users to learn and share their skills with industry.

This skill development and sharing will be incorporated into:

- student professional development activities
- the 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 and symposia
- 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 of the Centre and its partners. This commissioned 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 partners.

For 2022–23, the Centre has formal arrangements in place with two organisations to undertake fully funded commissioned research:

- Department of Environment, Land, Water and Planning (Vic)
- Country Fire Authority (Vic)

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 research program.

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

- deliver educational workshops and seminars based on research findings and outcomes
- develop training and professional development packages that can be managed and delivered within individual organisations
- 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 institutions to develop customised accredited and professional development subjects and courses. This will strengthen the Centre's education and training participants' capability of working 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 of research outcomes into practice (i.e. implementation).

This will include:

- an annual global research conference
- jurisdictional research and utilisation workshops
- subject matter workshops and symposia
- research-informed scenario and exercise development
- an outreach program that makes science accessible to all partners 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 corporate documents.

The most current version of each of these documents can be found in the 'About Us' tab on the Centre's website: www.naturalhazards.com.au/about-us/corporate-documents

Specific corporate documents can be found using the following links:

Strategic Plan 2021–2031: www.naturalhazards.com.au/sites/default/files/2022-05/NatHazResAus%20StratPlan%20FA02.pdf

10-Year Research Strategy: www.naturalhazards.com.au/sites/default/files/2022-05/NatHazResAus%2010yr%20Research%20Strategy%20FA01.pdf

Research Data Management Framework: www.naturalhazards.com.au/sites/default/files/2022-05/NatHazResAus%20Data%20Management%20Framework.pdf

National research priorities for disaster risk reduction and community resilience to the impacts of natural hazards (2022): www.naturalhazards.com.au/sites/default/files/2022-05/NatHazResAus%20ResearchPriorities%20FA02.pdf

Attachment 1: Approved projects

The following Centre-funded projects have been approved by the Board and are in various stages of development. Several more projects, funded by partners and end-user organisations, are also in progress.

Details of all active projects can be found on the Centre's website at **www.naturalhazards.com.au/research/research-projects**.

- Community experience of 2022 east-coast floods (through the Rapid Disaster Research Program)
- Translation of observed and modelled extreme bushfire behaviours to improve fire prediction and fireground safety
- Predictions in public: understanding the design, communication and dissemination of predictive maps to the public
- Connecting Indigenous people and the emergency management sector – effective partnerships
- Cultural land management research and governance in south-east Australia
- Community-led recovery: evidence, dimensions and supports for Community Recovery Committees
- Identifying water sources for aerial firefighting
- Bushfire information database – scoping study
- Understanding the resilience of lifelines for regional and remote communities
- Research data management
- Awareness, education and warning programs for cascading and compounding events
- Improving predictions and warnings for flash flooding
- Protecting homes from bushfire
- Decison-making in emergency management
- Bushfire risk at the rural–urban interface
- Severe weather impact prediction
- Modelling the impacts of cascading and compounding natural hazards on built environment
- Robust temporary building repairs
- Mitigating natural hazard impacts in urban environments
- What makes a good fire simulator?
- Storing and sharing qualitative data
- State-wide, multi-hazard community risk assessment
- Fire reconstruction: developing a systematised methodology for collecting the meteorological data required for bushfire reconstructions

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