Natural Hazards Research Australia

Call for Expressions of Interest

T8-A6 Unlocking risk: Enhancing hazard risk assessment through historical archival reanalysis

Expressions of Interest due **5pm AEDT, 17 March 2025**
to research@naturalhazards.com.au

Australian Government

Overview

Natural Hazards Research Australia (hereafter the Centre) is seeking Expressions of Interest from project teams for the following project:

T8-A6: Unlocking risk: Enhancing hazard risk assessment through historical archival reanalysis

Project description	This research aims to significantly improve the characterisation of historical hazard events by enhancing the quantity and quality of data available for research. This aim will be achieved through the following steps: → Conducting a comprehensive literature review and stakeholder consultation to define the scope of data acquisition for historical earthquake, storm surge and cyclone hazard events in a minimum of three case study regions. → Performing a thorough search of online databases for primary source material and making in-person visits to libraries, state and agency archives for non-digitised materials in case study regions. → Engaging appropriately with First Nations groups to understand historic hazard events. → Analysing historical data to robustly characterise each event (e.g., earthquake location and magnitude), focusing on hazards of particular concern to stakeholders in agreed case study regions. → Establish methods for translating historical accounts into characterisation of the hazards that can inform current risk assessments and supporting databases. → Making the data collected available to hazard researchers and disaster risk practitioners. → Developing the methodology with built-in flexibility to enable its application to additional hazards and jurisdictions in the future.
Estimated duration	Three years
Budget	The budget envelope for this project is $300,000 to $500,000 (ex GST) The research team should note that this is a competitive process. Expression of Interest submissions will be assessed on value for money and justification for any funds requested.
Related national research priorities[1]	→ Evidence-informed policy, strategy and foresight → Learning from disasters
Related Centre research priorities for 2024–26[2]	→ Understanding and mitigating risk → First Nations knowledges
Supporting organisations	→ South Australia Fire and Emergency Services Commission → Department of Fire and Emergency Services – Western Australia → Queensland Fire Department

1 Natural Hazards Research Australia (2022) National research priorities for disaster risk reduction and community resilience to the impacts of natural hazards, accessible at www.naturalhazards.com.au/sites/default/files/2022-05/NatHazResAus ResearchPriorities FA02.pdf

2 Natural Hazards Research Australia (2024) *Biennial Research Plan 2024–26*, accessible at https://www.naturalhazards.com.au/sites/default/files/2024-07/NHRA%20ResearchPlan24%E2%80%9326%2004.pdf

Centre contact	For any questions regarding this Call for EOIs, please email research@naturalhazards.com.au.
Online project briefing	For more information or questions, an online project briefing webinar will be held at **12pm AEDT on 26 February 2025**
Submission of EOI	EOIs must be prepared using the Centre's EOI submission form and Budget Template. EOIs are to be submitted to research@naturalhazards.com.au by **5pm AEDT on 17 March**

Statement of requirements

Background and context

Understanding and mitigating natural hazard risks in Australia has traditionally relied on historical data. However, this approach often overlooks the rich knowledge systems of First Nations peoples and may have been further constrained by the limitations of historical records, including inconsistent methodologies and restricted accessibility. Overcoming these challenges is crucial for improving our understanding of past hazard assessments and identifying lessons that may inform contemporary risk mitigation strategies, considering the evolving nature of infrastructure and societal dependencies. The rapid expansion of online historical databases has greatly increased the accessibility of information, yet much of this data remains underutilised in studying historical events. By leveraging data, hazard models can be refined and the understanding of the characteristics of a hazard event (for example scope, scale) can be enhanced, representing a significant advance in hazard research and mitigation efforts.

Recently work such as that undertaken by researchers, Geoscience Australia (GA) and the PerilAUS[3] database demonstrated that natural hazard risk can be assessed by leveraging the historical record[4]. One collaboration aimed to improve understanding of large pre and early instrumental earthquakes, which are key for estimating current seismic hazards. The study found that historical accounts, often used in such assessments, can inaccurately characterise events, potentially biasing modern hazard forecasts. For instance, 100 years after Queensland's largest earthquake, researchers discovered the epicentre was over 250 kilometres from its previously believed location. Research on the 1 March 1954, South Australia earthquake also challenges previous assumptions. Initially linked to the Eden-Burnside Fault near Darlington, new analysis of macro-seismic and instrumental data suggests the epicentre might have been mislocated, with damaging shaking extending into the Adelaide Hills. These findings indicate the 1954 event could have been more significant than previously thought, highlighting seismic risks for urban centres like Adelaide.

The findings suggest potential mischaracterisations in historical hazard records, highlighting biases and underscoring the need for a comprehensive and inclusive re-analysis to improve risk assessments. Improved access to archives and technological advancements offers a chance to reevaluate and verify the accuracy of this data. The developed modelling techniques will be extended to storm surge and cyclone assessments, with interest from the Department of Fire and Emergency Services (DFES) and the Queensland Fire Department (QFD). The research offers strategies that could enhance natural hazard management in various contexts, providing adaptable solutions that contribute to improving hazard management practices across different domains.

This research seeks to further the concept of leveraging historical data to enhance our understanding of natural hazard risk across a broader range of hazards. It will do this by examining historic earthquake, storm surge and cyclone events to develop a methodology that can be replicated to produce a characterisation of historic hazards that can inform current risk assessments and supporting databases.

Re-evaluating these events will improve our understanding of natural hazard threats to Australian communities. Appropriate collaboration with First Nations groups may also extend the historical record of hazard events and enhance risk-informed decisions. The research will work with South Australia, Western Australia and Queensland representatives though the historic hazards analysed can be anywhere in Australia.

3 Mortlock, T. R., Nott, J., Crompton, R., et al. (2023). A long-term view of tropical cyclone risk in Australia. Natural Hazards, 118(3), 571–588. https://doi.org/10.1007/s11069-023-06019-5

4 Nott, J. F. (2015). Palaeostorm surges and inundations. In J. F. Shroder, J. T. Ellis, & D. J. Sherman (Eds.), Coastal and marine hazards, risks, and disasters (pp. 129-152). Elsevier. https://doi.org/10.1016/B978-0-12-396483-0.00005-4

Project description

This research aims to significantly improve the characterisation of historical hazard events by enhancing the quantity and quality of data available for research.

This aim will be achieved through the following steps:

- Conducting a comprehensive literature review and stakeholder consultation to define the scope of data acquisition for historical earthquake, storm surge and cyclone hazard events in a minimum of three case study regions.*
- Performing a thorough search of online databases for primary source material and making in-person visits to libraries, state and agency archives for non-digitised materials in case study regions.
- Engaging appropriately with First Nations groups to understand historic hazard events.
- Analysing historical data to robustly characterise each event (e.g., earthquake location and magnitude), focusing on hazards of particular concern to stakeholders in agreed case study regions.
- Establish methods for translating historical accounts into characterisation of the hazards that can inform current risk assessments and supporting databases.
- Making the data collected available to hazard researchers and disaster risk practitioners.
- Developing the methodology with built-in flexibility to enable its application to additional hazards and jurisdictions in the future.

*: Regions may span multiple local government areas that have been affected by historical hazard events

Expected outputs

Outputs are the products that are expected to be delivered by this project.

Core outputs

- Literature review
- Methodology for translating historical accounts into characterisation of the hazards that can inform current risk assessments and supporting databases
- Data catalogue
- Final report – including identification of future research opportunities
- Stakeholder presentations
- Academic publications in high-ranking international journals
- Data provided for inclusion in authoritative national databases
- Data catalogue
- Please detail other innovative outputs that your team can deliver to address the outcomes below.

Additional outputs

- Project plan and plain language statement
- Quarterly progress reports
- Project evaluation report
- Relevant communications outputs including but not limited to a presentation and a poster

Collaborative approach

Researchers are expected to undertake the research using a collaborative approach to assist in the translation and transfer of knowledge to end-users and to ensure the project meets their needs. Researchers are encouraged to outline their approach to ensuring effective collaboration which could include embedding researchers within end-user organisations for a period of time.

Anticipated outcomes

The research aims to

- enhance the characterisation of historical earthquake, storm and cyclone events
- improve the accessibility of this data for hazard researchers, emergency managers and the public.

This effort will yield several outcomes contributing to enhanced disaster resilience.

1. The research will provide more robust hazard estimates. This can impact building codes, insurance premiums and land-use planning.
2. It will produce enhanced data that will contribute to understanding maximum credible events, crucial for scenario exercises and mitigation measures, such as designing evacuation routes and emergency facilities, ultimately improving disaster simulations and community resilience.
3. Improved and appropriate use of First Nations knowledge will enhance modern archives of historical events.

These outcomes will offer valuable insights for South Australia, Queensland and Western Australia and potentially improve risk-informed decision-making processes elsewhere within Australia.

Improved access to historical event data will enable stakeholders to make more informed decisions and support proactive measures to reduce the impact of future disasters, including hazard assessment and targeted mitigation measures.

Quality control and reporting

The project will be overseen and supported by a Project Management Committee (PMC) comprising the Principal Researcher, a Centre representative, and at least one stakeholder representative. Composition of the PMC will be determined in consultation with the Principal Researcher.

Reports

The Centre expects that the outputs delivered by this project will meet the highest scientific standards and will be suitable for publication on the Centre website and in industry newsletters, as well as in high-quality scientific journals.

The successful research organisation/s must co-develop with end-users a project plan and project summary using the Centre's templates. The project summary should explain in plain language what the project is about, what questions it intends to answer and describe the expected practical outputs that will make use of the research findings. The project plan must be approved by the PMC and will become an attachment to the contract.

Reports (and any supporting material) must be submitted to the PMC's satisfaction and will be subject to review by PMC members. The project team will be required to ensure an internal peer review process is undertaken prior to the final report being submitted.

Milestone reporting

The project team must report all milestone deliverables and engagement activities into the Centre's Project Management System. This will include sufficient justification for the completion of milestones to the satisfaction of the PMC and the Centre.

Communication

To further assist with quality assurance, it is expected that:

- regular PMC meetings will be held
- the project team will use a consultative approach, documented in quarterly reports
- the Principal Researcher will give periodic presentations to key stakeholder groups to gain critical feedback on project milestones.

Additional quality control processes may be agreed as part of the project planning process.

Contractual arrangements

A copy of the 'Research Services Agreement', the proposed form of contract for the purposes of this project, can be found here.

The Centre reserves its rights to make amendments to the form of contract.

This agreement should be reviewed by applicants as part of the EOI submission.

If you would like to request amendments to any of the terms and conditions set out in the proposed form of contract, details of the proposed changes and the reason the changes are requested must be included in the EOI submission form. Requests for any changes will be at the sole discretion of the Centre.

Selection as a shortlisted or preferred provider does not give rise to a contract (express or implied) between the shortlisted or preferred provider and the Centre for the supply of goods or services. No legal relationship will exist between the Centre and the shortlisted or preferred provider until such time as a binding contract in writing is executed by both parties.

In the case of consortiums, the Centre requests that one consortium member be nominated as Lead Research Provider and take responsibility for subcontracting other parties.

Submitting an Expression of Interest

Application and review process

Project selection and approval will be a two-stage process. The first stage is evaluation of the EOIs that are received. The second stage is development of a project proposal, where a preferred provider will be selected and offered an opportunity to co-develop a detailed project proposal with input from key stakeholders.

Key dates

17 February 2025	Call for EOIs opens
26 February 2025	Online project briefing
17 March 2025	Due date for EOIs

Submission requirements for this EOI

Project teams responding to this EOI are required to submit their response using the Centre's EOI submission form and Budget Template. Submissions must include:

- a statement of capability (max 600 words), including the proposed contributions of each research team member to the project
- a statement (max 400 words) about the diversity of the project team
- a statement (max 400 words) about the project's inclusion and respect of First Nations peoples, philosophies, cultures, rights and/or knowledges
- an outline (max 1000 words) describing how the project team intends to approach the project, strategies for effective collaboration and an indicative methodology
- an indicative schedule of work and interim milestones/project outputs as described in this document
- a proposed project budget in line with the budget envelope provided, including details of any in kind contribution from research organisation/s – a detailed budget to be provided using the downloadable Budget Template provided on the Centre's website
- a clear statement (max 400 words) describing the outcomes that will be delivered for this project and how they will be used by stakeholders
- a clear statement (max 400 words) describing the outputs that the proposed approach to this project will deliver and how the findings could translate into practice
- a statement (max 500 words) demonstrating the project team's relevant industry and stakeholder engagement
- a risk management statement (max 500 words)
- any requested changes to the Centre's proposed form of contract
- up to two-page CVs for each proposed project team member.

Additional information

In responding to this Call for Expressions of Interest, advice should be provided on any known or anticipated impacts of COVID or other pandemic restrictions or human resource risks on the timely delivery of the project. Where appropriate, risk management for the impacts of pandemic restrictions should be incorporated into the EOI.

Frequently asked questions

Additional information provided to individual respondents will also be published on the Centre's website to ensure access to all interested parties. Respondents are encouraged to check the website for any additional information via these published FAQs, prior to the closing date.

Online project briefing

An online webinar scheduled for **12pm AEDT on 26 February 2025** will provide a more detailed briefing of the project and the opportunity for interested parties to pose specific questions.

Registrations for this webinar can be made via the project page on the Centre's website. Once completed, a recording of this webinar will be posted to the website to ensure all interested respondents have access to this information.

Evaluation criteria

After the closing date, the Centre will review submitted EOIs against the evaluation criteria below. The evaluation criteria provide an indication of those matters that should be included in the EOI and supporting material – details are provided in the table below.

The Centre reserves the right not to offer the work, or only allocate a proportion of the available funding, if a proposal does not meet the Centre's needs. The Centre reserves the right to invite any other specific researchers as it sees fit to submit proposals before or after the closing date.

Evaluation criteria	% weighting
Research capability: the capacity and capability to deliver an excellent research project in an Australian environment	20
Project approach: a demonstrated understanding of the project requirements and a proposed project approach and methodology that is appropriate, feasible and robust Relevant outline of a collaborative approach to assist in the translation and transfer of knowledge to end-users and to ensure the project meets their needs.	30
Project outcomes and outputs: demonstrate a high-level understanding of the intentions of the project and how outputs/outcomes translate to practice	20
Industry engagement: strong track record of industry engagement with the ability to support and influence Australian disaster management at a national or state/territory level through interaction with key stakeholders	15
Value for money: delivery of required outcome within available budget along with the ability to leverage the funds provided with in-kind contributions or supplementary opportunities	15