Installing seismograph at Thirsty Ridge site, South Westland

Photo credit: GNS Science

Research Strategy

2024

Building the evidence base to support smart decision-making and lead to innovative ways to reduce impacts from natural hazards.

Natural Hazards Commission
Toka Tū Ake

Te Kāwanatanga o Aotearoa
New Zealand Government

Goal

Our goal is to invest in research and capability targeted at reducing the risk of impacts from natural hazards on people, property, and the community.

Objectives

Invest in research and capability that are aligned to the organisation's legislative functions and strategic goals and objectives.	Coordinate research investment across the research sector to maximise outcomes.	Improve the visibility of the research we invest in so that it can be used to reduce risk.	Develop researchers' capability in communicating their research and effectively collaborate and engage with policy, practice, and wider communities.	Support research that seeks to understand and draw on diverse world views and perspectives and that supports improved outcomes for all communities.

Priorities

• Ensure we invest in research aligned with our strategic objectives. • Ensure research is well managed and timely to inform policy and practice activities. • Provide opportunities that are equitable, transparent, efficient, and meet the needs of those involved. • Build research capability in critical disciplines. • Track, monitor, and potentially evaluate the benefit of research.	• Coordinate with other research programmes and organisations with shared or aligned outcomes. • Support the Science, Innovation and Technology system changes to ensure they meet our research needs. • Improve understanding of research environment to ensure the paths to uptake are well understood, efficient and effective. • Collaborate with others to ensure research benefit is realised.	• Ensure users of research – both internal and external - know what we support and the potential benefit. • Improve accessibility and usability of research to a variety of users, including related data and information. • Ensure Natural Hazards Commission Toka Tū Ake is recognised for its investment and role in natural hazards resilience research. • Ensure research is shared widely across the system.	• Build researchers' confidence in communicating research. • Support researchers to develop well written and needs-led proposals. • Improve understanding how research is used and needed by policy, practice, and communities. • Build strong relationships and effective collaborations between research, policy, practice, and communities.	• Invest in research that supports the aspirations of diverse communities • Support the focus areas outlined in Vision Mātauranga. • Support the incorporation of diverse world views by supporting community-centred research methodologies.

Research themes

Quantifying hazards and risk	**Supporting people and decisions**	**Resilient Buildings**	**Smarter Land Use**

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Introduction

Purpose

The purpose of this strategy is to guide our investment in research and research capability to inform, enable and promote decisions that reduce New Zealand's vulnerability and exposure to natural hazard events.

This Research Strategy, which supports our wider Resilience Strategy for Natural Hazard Risk Reduction, sets out our research goal 'to invest in research and capability targeted at reducing the risk of impacts from natural hazards on people, property, and the community', and how we will achieve it.

Besides our own organisation's needs, this strategy is to inform researchers, practitioners and researcher programme leaders of our intent to invest and partner with others to build New Zealand's natural hazards knowledge base that will be used to improve our resilience.

We operate under the Natural Hazards Insurance Act, which sets out our mandate to: 'facilitate research and education, and to contribute to the sharing of information, knowledge and expertise'. To that end, we invest millions each year into research that contributes to a growing body of evidence to inform decision-making and lead to innovative ways of reducing natural hazards risks and impacts.

Our research investment also plays a key role in building New Zealand's capability and capacity to prepare for future natural hazard events, by growing a workforce of researchers, practitioners and policymakers that put natural hazards resilience at the heart of decision-making. The projects and programmes we invest in provide pathways for developing partnerships that support the translation of research into policy, practice, and community action.

Researchers installing seismometers in Southland

Challenges

This strategy is timely given the many challenges facing New Zealand's natural hazards research sector, including:

- rising costs of research across the system,
- university cuts, including to essential programmes such as geotechnical, geophysical, and geospatial courses, and
- science system reform, including uncertainty related to changes to research organisations, funding priorities, reduced funding, and changing funding mechanisms.

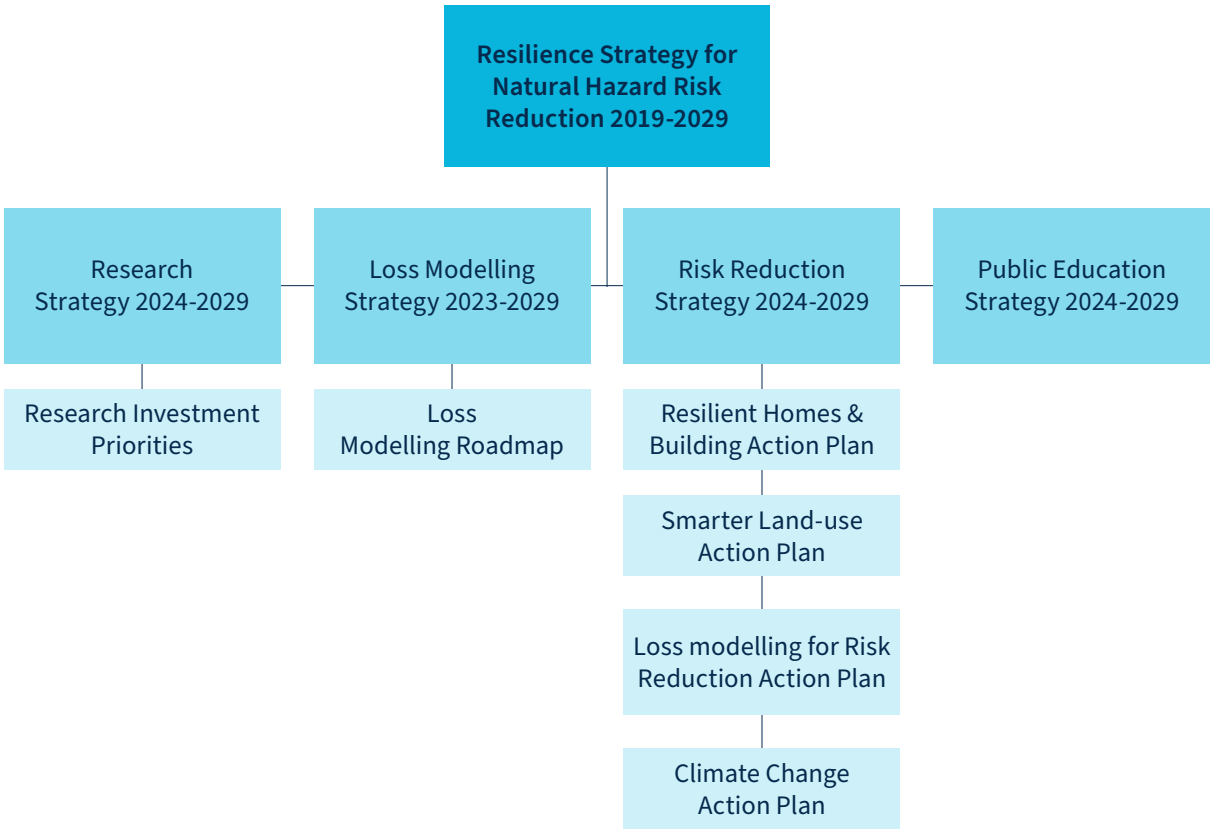
This strategy provides a basis as we navigate changes in the system, helping guide our investment decisions, track benefits, and provide clarity about how we will enable knowledge sharing and uptake of research outcomes, so its benefits are realised. It also helps us tailor our research to the specific natural hazards in New Zealand, including through a mātauranga Māori lens, and the specific needs of New Zealanders, as we consider ways to reduce the impact of natural hazards and improve community resilience.

Likewise, this strategy benefits the research community through providing transparency about our research investment priorities, and how we support capability development in science communication to improve research uptake.

Strategic context

This strategy sits within, and supports, the delivery of our Resilience Strategy for Natural Hazard Risk Reduction. It sits alongside and compliments our Loss Modelling, Risk Reduction, and Public Education Strategies as the evidence research provides informs that work. The intention is that this strategy also supports other strategies, action plans and roadmaps across our organisation, such as the Te Ao Māori Strategy, the Smarter Land Use, Resilient Buildings, and Climate Change action plans.

Research strategy within the strategic context



Our research goals and objectives

Enduring research goal

Our goal is to invest in research and capability targeted at reducing the risk of impacts from natural hazards on people, property, and the community.

We are achieving our goal by investing in:

- research, to build the knowledge, data and insights on natural hazards impacts and the ways to reduce them
- capability, to ensure there are people to not only conduct novel research but speak to it, stand by it, apply it, and advocate for its use in decision-making.

Research objectives

Five objectives outline key areas of focus to support us in achieving our goal.

1. **Invest** in research and capability that is aligned to our organisation's legislative functions and strategic goals and objectives.
2. **Coordinate** research investment across the research sector to maximise outcomes.
3. Improve the **visibility** of the research we invest in so that it can be used to reduce risk.
4. Develop researchers' **capability** in communicating their research and effectively collaborating and engaging with policy, practice, and wider communities.
5. Support research that seeks to understand and draw on **diverse** world views and perspectives and that supports improved outcomes for all communities in relation to resilience to natural hazards.

Researcher and stakeholder workshop

Priorities and success indictors for each objective

This section contains a summary of each objective, including:

- the priorities for the next five years
- our success indicators for each priority
- how the objective meets the Natural Hazards Insurance (NHI) Act 2023 Resilience Criteria.

Objective 1: Invest in research and capability that is aligned to our organisation's legislative functions and strategic goals and objectives.	
Priorities	**Success Indicators**
1.1 Ensure we invest in research aligned with our strategic objectives.	All investments are assessed according to our Research Investment Priorities Statement or are driven by our organisation's business needs, strategies, roadmaps or action plans.
1.2 Ensure research is well managed and timely to inform policy and practice activities.	Investments are planned and monitored so that research is delivered in time for potential benefit to be realised.
1.3 Provide opportunities that are equitable, transparent, efficient, and meet the needs of those involved.	Funding opportunities are fit for purpose, are accessible to all who are eligible, are fairly assessed and sufficiently resourced to deliver the intended research outputs.
1.4 Build research capability in critical disciplines.	There is a skilled and talented workforce to support our resilience goals.
1.5 Track, monitor and evaluate the benefit of research.	Benefits Management Framework is tracking and evaluating research impact. Defined metrics and qualitative measures are part of the framework and aligned with existing standards where appropriate.

How this objective meets the NHI Act Resilience Criteria: Responsible stewardship of the fund and investing in research focused on understanding our risks and how to manage them.

- As stewards of the fund, we have a responsibility to manage the research we invest in an appropriate way and encourage the research uptake so benefit can be realised.
- Monitoring and tracking benefit of research helps us understand the impact our research investment is having and how.
- Investing in research that supports reducing the impacts to people, property, and the community, can reduce the cost of damage and improve resilience.
- A skilled and talented workforce ensures delivery of targeted research and supports use of research into policy and practice where it can be used to manage natural hazards risk.

Researchers in the Wairau Bar (supplied by Dr Shaun Williams)

Objective 2: Coordinate research investment across the research sector to maximise outcomes.	
Priorities	**Success Indicators**
2.1 Coordinate with other research programmes and organisations with shared or aligned outcomes.	We are actively involved in aligning research programmes; research projects are well coordinated across programmes. Projects are complimentary and there are no actual or perceived duplications of effort.
2.2 Support the Science, Innovation, and Technology system changes to ensure they meet our research needs.	We are engaged in the Science, Innovation, and Technology system changes and understand how they impact our investments and the work of our research partners.
2.3 Improve understanding of research environment to ensure the paths to uptake are well understood, efficient, and effective.	Our research investments align with other research in the sector and our funded researchers and research is contributing to improvements in the sector.
2.4 Collaborate with others to ensure research benefit is realised.	A significant number of our research activities collaborate with other relevant programmes to ensure the research is taken up.

How this objective meets the NHI Act Resilience Criteria: Responsible stewardship of the fund

- Our research investment is relatively small compared with other sources in the science system. This objective is to ensure we are making the most use of the Fund and leveraging existing work or filling research gaps. The potential benefit to insured people is that they are assured we are strategically investing in research targeted to reduce their risk to natural hazards.

PhD researcher Elaine Smid (photo supplied)

Objective 3: Improve the visibility of the research we invest in so that it can be used to reduce risk.	
Priorities	**Success Indicators**
3.1 Ensure users of research – both internal and external - know what we support and the potential benefit.	Stakeholders understand what research we invest in, how it may be used and what potential impact it has.
3.2 Improve accessibility and usability of research to a variety of users, including related data and information.	Researchers and end-users know where to find the research outputs, can understand them and how they can be used.
3.3 Ensure the Natural Hazards Commission Toka Tū Ake is recognised for its investment and role in natural hazards resilience research.	Stakeholders know we are proactive in understanding our hazards and how to reduce the impacts of them.
3.4 Ensure research is shared widely across the system.	Natural hazards research is shared and discussed at workshops and conferences to promote knowledge exchange.

How this objective meets the NHI Act Resilience Criteria: Evidence base is available to make informed decisions

- Improving the visibility of research and its benefit supports the uptake of research into policy, practice and by communities. This is vital for research benefit to be realised as it supports sharing information and knowledge with those who need it.

Professor Martha Savage on 1News

Objective 4: Develop researchers' capability in communicating their research and effectively collaborate and engage with policy, practice, and wider communities.	
Priorities	**Success Indicators**
4.1 Build researchers' confidence in communicating their research.	Researchers feel confident in presenting their research to well informed but non-expert audiences.
4.2 Support researchers to develop well written and needs-led proposals.	Research is designed with the end-user and has an appropriate level of engagement throughout the research project.
4.3 Improve understanding of how research is used and needed by policy, practice, and communities.	Researchers understand the potential paths to uptake for their research and know the people and agencies crucial to that process.
4.4 Build strong relationships and effective collaborations between research, policy, practice, and communities.	Improvements in uptake of research by end-users, such as reduced time between availability and uptake, and agreed approaches on the implementation of research into practice.

How this objective meets the NHI Act Resilience Criteria: Evidence base is available to make informed decisions – potential benefit to insured

- Researchers are a trusted voice and supporting their ability to communicate and advocate for the use of their science in decision making will help uptake of research, ensuring our investment has the highest likelihood for potential benefit to be realised.

Scientists share their research at a conference

Objective 5: Support research that seeks to understand and draw on diverse world views and perspectives and that supports improved outcomes for all communities in relation to resilience to natural hazards.	
Priorities	**Success Indicators**
5.1 Invest in research that supports the aspirations of diverse communities.	Research projects we fund are driven by the priorities of communities and are aligned with our strategies and purpose leading to improved resilience outcomes for communities, including Māori.
5.2 Support the focus areas outlined in Vision Mātauranga.	This may translate into areas such as: • supporting activities that build Māori research capability and participation in research. • understanding, respecting and applying Mātauranga Māori appropriately.
5.3 Support the incorporation of diverse world views by supporting community-centred research methodologies.	Communities are enriched through engaging and participating in research that supports their needs.

How this objective meets the NHI Act Resilience Criteria: Diverse community views enrich the evidence base to make informed decisions to improve resilience for everyone. Improved insurance accessibility and customer experience benefits all insured persons.

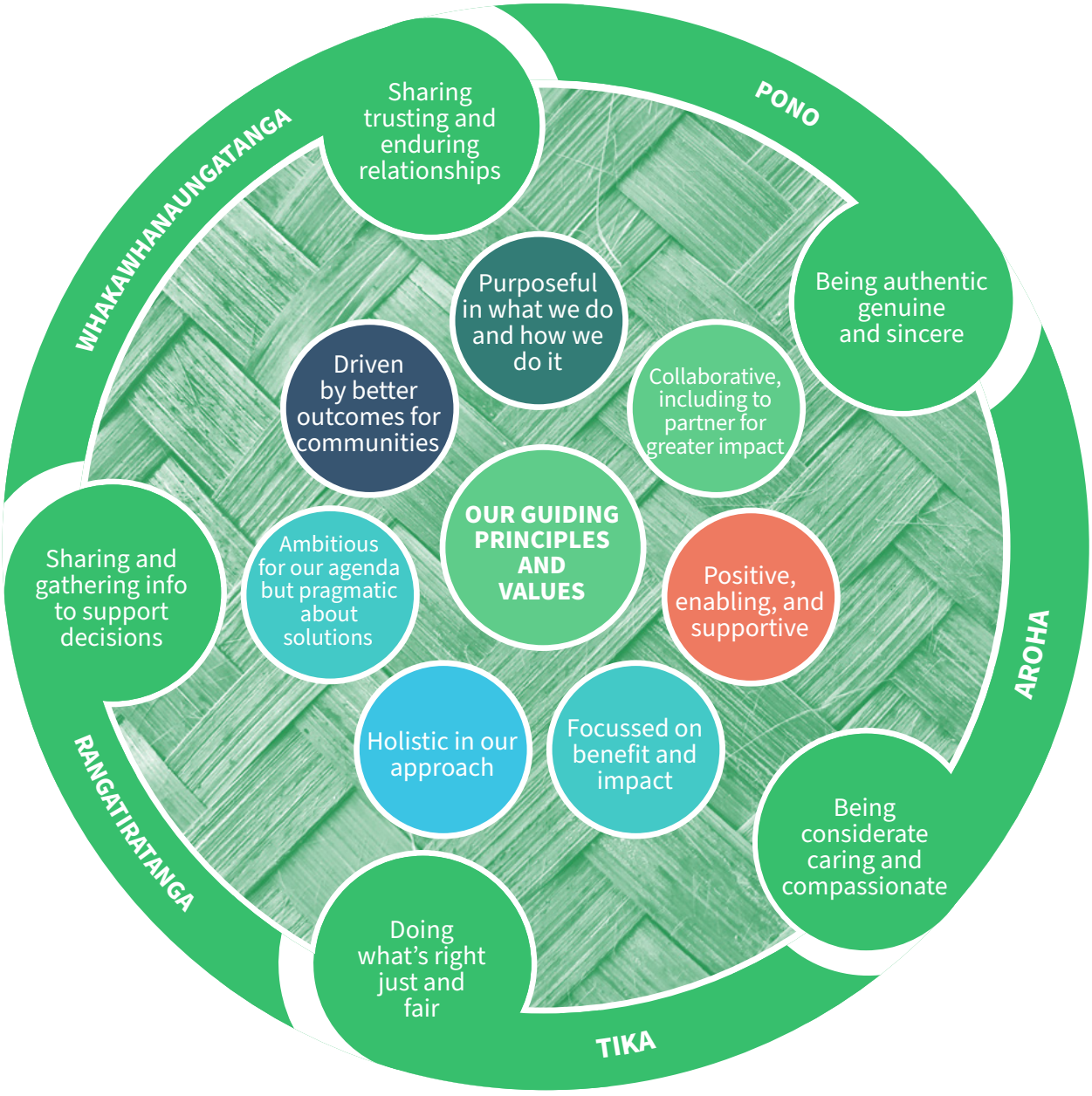
Researchers at noho marae

Implementation of this strategy

Our guiding principles

Given the breadth of our research interests and activities, and the challenges on the horizon for the science system, we need to be able to adapt to our changing environment.

In delivering our strategic objectives for research, we follow the guiding principles of the Resilience Strategy for Natural Hazards Risk Reduction:



The following additional principles are designed to support our way of working and prioritisation for our research investment:

- **balance and alignment** - investments are aligned with our strategies, roadmaps, and action plans.
- **responsible** - we understand the context surrounding our research investments to ensure effective and appropriate use of levy and public funding.
- **diversity** – we support a diverse community of researchers through a variety of projects and programmes.
- **capability** – we support capability building across the Science, Innovation and Technology system as relevant to managing New Zealand's natural hazard risks.
- **growing the evidence base** – supporting the development of knowledge and the use of that knowledge for decision making.
- **innovation** – supporting innovation, creativity, and ingenuity.

Our five-year plan

A five-year workplan of activities supports the delivery of this strategy. It includes detailed activities to support each objective, including funding rounds and the implementation of a Benefit Management Framework.

A Research Investment Priorities Statement also supports the strategy. The Priorities Statement is an external-facing document that outlines the research opportunities and gaps we see in New Zealand's natural hazard risk and resilience research landscape. Its goal is to define our research priorities, so that researchers can align their proposals with our areas of interest and will drive the research community in a direction that supports greater resilience to natural hazards.

Toward the end of the five-year term, we will publish a Portfolio Review to examine how our research investments have met our strategic goals and to illustrate where the potential benefits of our investments have been realised.

Research themes

Our research portfolio is split into four themes[1] which we have identified as key areas of investment to support our goal. Research projects and programmes often contribute to more than one theme.

Quantifying hazards and impacts

Research to improve understanding of New Zealand's natural hazards, in particular data and models to quantify the magnitude and frequency of hazards and their impact.

Supporting people and decisions

Research that enables individuals, communities, and decision makers to understand, manage, and mitigate various risks, covering governance, economics, and social and behavioural aspects of disaster risk management.

Resilient Buildings

Research focused on understanding and improving building and land performance to ensure buildings are designed, built, and retrofit for resilience.

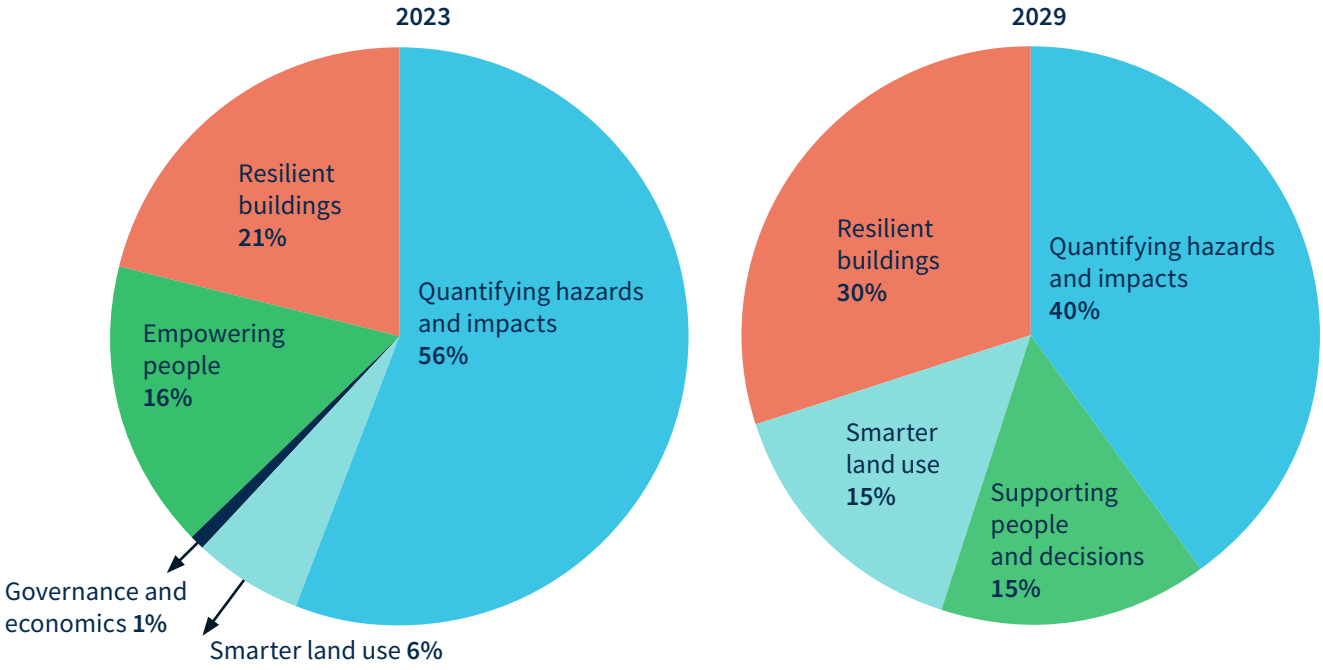
Smarter land use

Research focused on understanding, managing, and improving land use so we can make smarter decisions and build stronger homes on better land.

1 We have reduced our themes from five to four through combining our previous "Empowering People" and "Governance and Economics" themes into "Supporting People and Decisions".

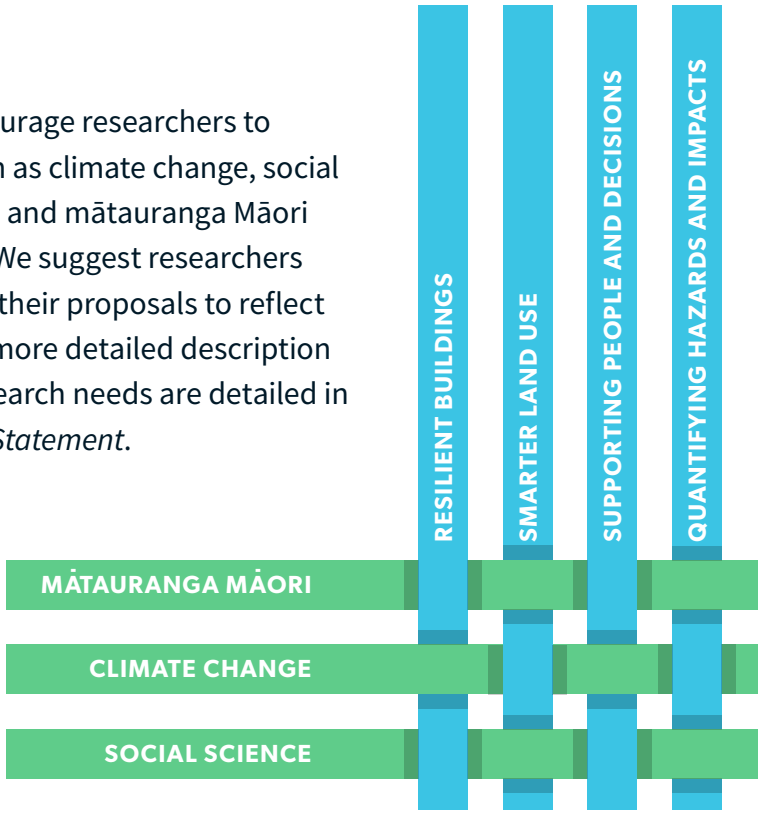
Our portfolio needs to be diverse to achieve our goals and to help us recognise new pressures and gaps in our knowledge. Over the next three years, we intend to balance our portfolio across the themes approximately as illustrated the chart below. This balance reflects the tendency of research in "Quantifying hazards and impacts" and "Supporting people and decisions" to support research in "Resilient buildings" and "Smarter land use".

Portion of Investment by research theme



Broader themes relevant to funded research

In addition to the themes, we encourage researchers to consider how broader themes such as climate change, social science, specific community needs and mātauranga Māori may be relevant to their research. We suggest researchers apply one or more of the lenses to their proposals to reflect on their philosophy and design. A more detailed description of each theme and the specific research needs are detailed in our *Research Investment Priorities Statement*.



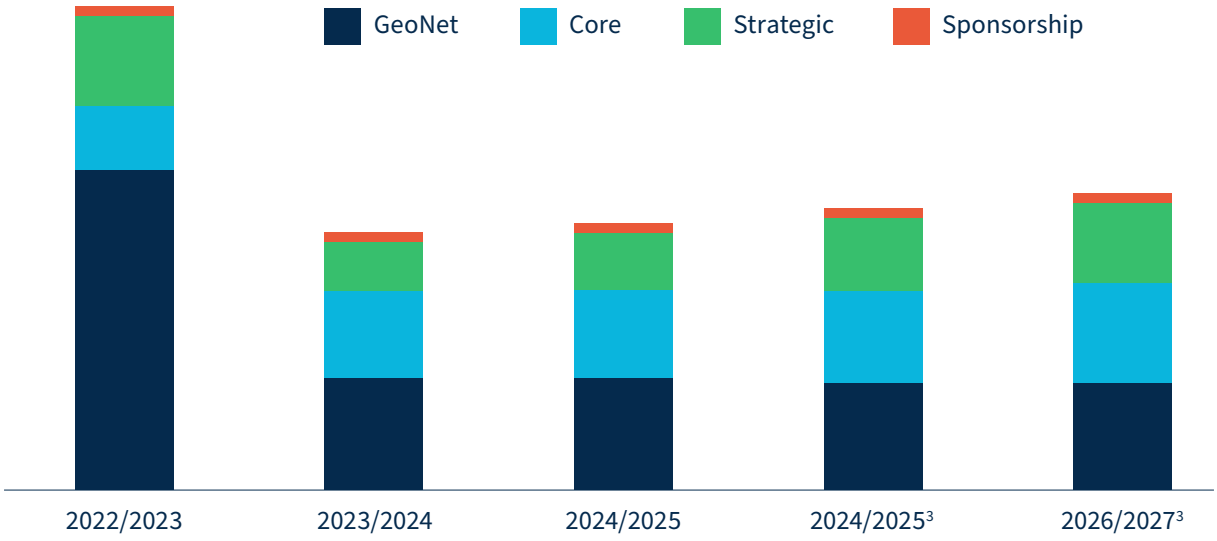
Types of research funding

Levels of research investment vary each year depending on existing commitments and expected new research opportunities. The budget is approved annually by our Board and funding cannot be carried over between years. Responsible management of our research is crucial to ensuring we have enough resources to achieve our goals.

Our research funding can be broken down into four types of funding:

1. **Core funding** — investment in research and research capability building, including:
   - contestable grants
   - PhD and postdoctoral scholarships.
2. **Strategic initiatives** — typically negotiated grants or services that meet a specific strategic or business need.
3. **Sponsorships** — funding to support knowledge exchange and collaboration.
4. **GeoNet** — investment in underpinning data to support natural hazards research.

Past and proposed future investment in research funding by type[2]



2 GeoNet gained financial support from central government in 2023 to cover the core of GeoNet services, allowing us to decrease our contribution.

3 Out-years are estimates only.

Collaboration to deliver research and build capability

We partner with research providers such as universities, Crown Research Institutes, and independent research organisations to deliver research programmes. These providers have a long-standing history of producing quality research in New Zealand and we have strong relationships with these agencies and their researchers. We are also keen to explore the use of bespoke research groups, such as iwi- or hapū-based research hubs, to deliver targeted, high-quality research to communities.

Building research capability typically occurs within universities, however the role of professional societies in upskilling and maintaining the expertise of specialists is an important role in maintaining a quality workforce.

Professional societies are also key to building consensus on the implementation of research into policy and practice. We will continue to support and collaborate with professional societies, such as the New Zealand Planning Institute and New Zealand Society of Earthquake Engineering, as they play a crucial role in utilising research for reducing natural hazard risks.

We intend to grow collaboration and coordination with other research funders and research programmes that have aligned or complimentary outcomes, such as BRANZ and QuakeCoRE. We hope our active participation in advisory groups, assessment panels and other forum, will provide insights into ways we can coordinate better to achieve our shared goals.

NHC presenting at the New Zealand Planner's Institute conference 2024

What are the attributes of a Natural Hazards Commission Toka Tū Ake supported researcher?

- They adopt a needs-led approach to research through an understanding of, and partnership with, the policy, practice and public communities.
- They apply the latest data, information, innovative technologies, and best practice methodologies to their research.
- They understand the policy and practice landscape and where their research should fit and is ideally needed.
- They understand the pathways to uptake of their research and actively support its use.
- They can communicate their research to a variety of audiences.
- They can effectively partner with different stakeholders and agencies in the design, conduct, and delivery of their research.
- They are advocates for natural hazards risk reduction.
- They carry out their research in culturally appropriate and ethical ways, given the diverse communities in New Zealand.

Professor Santiago Pujol (supplied by the University of Canterbury)

Benefit of our research and the effectiveness of this strategy

Funding Conditions under the Natural Hazards Insurance Act

One of our key functions is to administer the Natural Hazards Fund. This fund is primarily financed by levies from premiums paid by homeowners with fire insurance. Drawing on the fund for our research activities requires we meet the following criteria.

We believe on reasonable grounds that the activity has the potential to:

1. provide a benefit to insured persons (whether or not the activity also has the potential to provide a benefit to persons who are not insured persons); or
2. reduce the future cost of providing natural hazard cover.

Our overarching research goal to *"invest in research and research capability targeted to reducing the risk of impacts from natural hazards"* is broad but meets the criteria at a high level through the objectives of this strategy and our research themes.

We make research investments that have the potential to reduce the impacts of natural hazards to people, property, and the community. Once the research outcomes are implemented into policy, practice or community activities, the research has the potential to benefit insured people through reduced disruption and costs associated with repairing property, leading to positive wellbeing outcomes. We could expect to see fewer claims or reduced claim amounts, reducing the overall cost of the scheme.

Another potential benefit is related to understanding our risks. It is easier for us to secure reinsurance if we understand and can quantify our risks, including hazards, exposure, and the fragility and vulnerability of our homes. Sometimes an improved understanding of hazards can have the unintended impact of raising our reinsurance premiums, however reinsurers prefer we understand the risks and work towards reducing them.

Meeting these conditions is relatively straightforward for our research investments. We look at the evidence and reasoning provided in applications and assess whether they meet the resilience 'benefit test' criteria outlined in our Resilience Strategy for Natural Hazard Risk Reduction.

Benefit management for tracking, monitoring and evaluating research impact

We have adopted a benefit management approach to identify, define, measure, and manage the delivery of potential benefits from the research we fund.

The framework will give us greater visibility of how our funds are improving current and future resilience, and enables us to:

- have confidence that our investments are worthwhile,
- ensure that proposed benefits are realistic and achievable,
- demonstrate the impact and value of our investments, and
- embed lessons learned to continually improve our investment processes.

The benefit management framework will show us where benefits are on track to be fully realised and where we might usefully intervene if a programme or project is at risk of going off track.

Many of our funded research programmes and projects are working to deliver benefits that will accrue years or decades after their funding finishes. The benefit management framework provides us with the means to identify and measure these longer-term benefits.

Our definition of benefit is *"a measurable improvement resulting from funded research that aims to lower the cost of damage from future events and increase the ability of insured persons to recover."* This includes but is not limited to:

- a reduction of money spent on recovery/ claims, readiness, and cost of securing reinsurance.
- an improved outcome to insured persons, improved preparedness, increased resilience, reduced risk, reduced costs of homeowner, insurance availability and improved experience. This could be immediate, or over the short, medium or long term.

The implementation of our benefits management framework is a key focus of our strategy and sits across our objectives. It includes both capturing academic short-term benefits and monitoring for longer-term social and economic benefits.

Researchers studying liquefaction in Wellington

Measuring the effectiveness of this strategy

A review of the research portfolio will be conducted mid-way through and near the end of the strategic term. The review will summarise our research investment and related activities. It will include measures of short-term impact, such as, research outputs (data, publications, number of students), and some qualitative examples or in-depth case studies of longer-term impacts where research has been used in policy or practice to potentially reduce our risk to natural hazards.

The portfolio review will be supported by information from the benefits management framework and stakeholder surveys.

Our Resilience and Research Highlights report is an annual publication illustrating the activities and research investment each year. It includes short stories showcasing the people, projects, and programmes across our three Resilience functions: Research, Risk Reduction and Public Education.

Examples of quantitative measures that will be included in our reports

- Number of research outputs disseminated (through academic papers, professional guidance, conference presentations, media stories, etc)
- Number of knowledge transfer activities supported (sponsorship of conferences)
- Number of projects involving community participation
- Number of students completed (or supported)
- Percentage of research projects funded with collaboration with policy, practice and/or direct engagement with communities
- Stakeholders find the research we fund of high value and will contribute to our resilience goals (sourced from stakeholder survey).

Natural Hazards Commission
Toka Tū Ake

Te Kāwanatanga o Aotearoa
New Zealand Government