

The foundation from which we stand strong, together.

# Resilience and Research Highlights Report

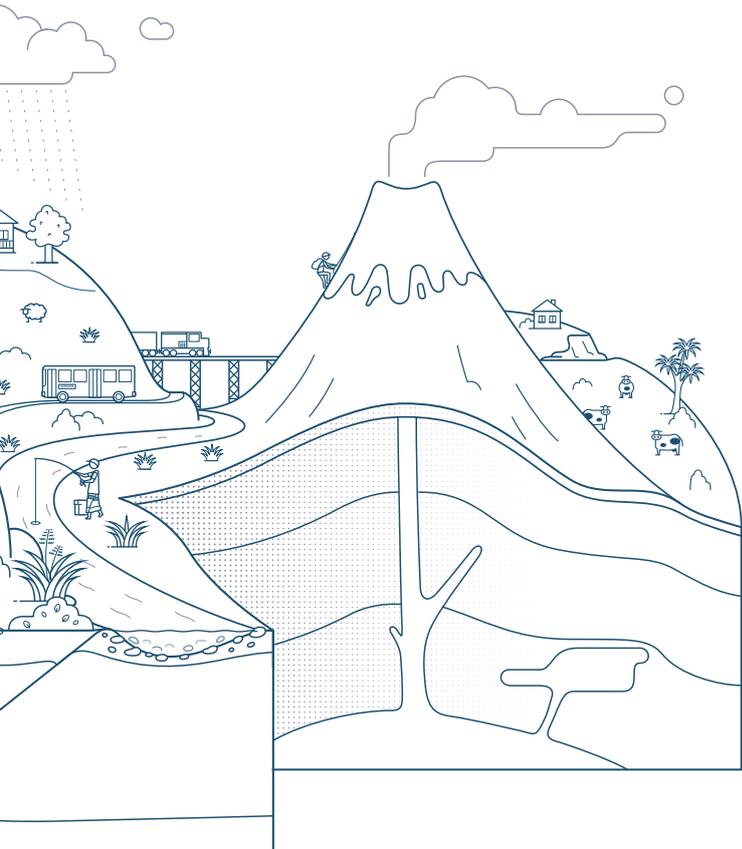
2023

**Our vision is that natural hazards resilience becomes embedded in all aspects of decision-making for our homes, towns and cities.**

Our resilience goal is to inform, enable and influence the choices and decisions that reduce vulnerability and the exposure of Aotearoa New Zealand’s built environment to natural hazard events. In simple terms, the result will be stronger homes, built on better land, served by resilient infrastructure, supported by affordable risk capital.

In pursuing this goal, we invest in creating, integrating and translating information and knowledge to drive risk reduction actions and build readiness to improve resilience.





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April 2024  
EQC Toka Tū Ake

**EQC.GOV.T.NZ**

# WELCOME TO OUR 2023 RESILIENCE AND RESEARCH HIGHLIGHTS REPORT

Kia ora koutou

**The priority for EQC Toka Tū Ake is reducing the impact of natural hazards on people, property and the community.**

Natural hazards are never far from mind in New Zealand. The extreme weather of 2023 brought into stark focus how quickly and drastically natural forces can uproot lives and communities. Many of those affected by events like Cyclone Gabrielle and the Auckland January floods are still rebuilding their lives.

As the public insurer looking after New Zealanders' homes, we have a keen interest in lessening the impact of natural hazard events on people and property. While we can't predict or prevent such events, there is a lot we can do to prepare for them.

Thanks to the brilliant work of researchers, modellers, planners, advisors, and many others in the natural hazards space, we are steadily increasing our understanding of risk and what we can do to mitigate it. At EQC, we help to fund and even do some of this work ourselves – this Resilience and Research Highlights Report puts the spotlight on what we've been doing to contribute to a more resilient New Zealand in 2023.

It's the last time this publication will appear under the EQC name, as we are changing our name to Natural Hazards Commission Toka Tū Ake to better reflect our role responding to a broad range of natural hazards. The name change aligns with welcoming our new legislation – the Natural Hazards Insurance Act – in July 2024. We look forward to this new era for our organisation.

In the meantime, I hope you enjoy the read.



**Tina Mitchell**  
Chief Executive

Titiro whakamuri  
Whakarite ināinei, hei hāngai whakamua



Tēnā koutou

**At EQC (soon to be Natural Hazards Commission Toka Tū Ake), we play an important role in helping ensure New Zealand is prepared for the next 'big one'.**

A resilient New Zealand is one in which the consequences of natural hazards are carefully considered at every level of decision-making, and the risks from natural hazards are minimised wherever possible.

We invest in research that provides a solid evidence base on which to build our risk reduction, advocacy and public education work. In 2023, our research investment reached \$14 million and incorporated a greater focus on mātauranga Māori, social sciences, and the effects of climate change – continuing the trend of diversifying our portfolio beyond physical sciences.

Research is most useful when it gets into the hands of people who need it. That's why we also translate findings into actionable advice for government, councils, industry, communities, and people on how to prepare for natural hazards, and prevent disasters.

One example is our Natural Hazards Portal, launched in 2023, which gives New Zealanders access to their local natural hazard risks and advice on how to minimise impacts.

Our public education campaigns and longstanding partnerships, like our work with Te Papa, ensure this important information gets to New Zealanders in an accessible, and sometimes even fun, way.

We also continue to be a voice for growth that prioritises risk reduction and resilience, through partnering with industry and submitting on government policies and plans.

We are gearing up for a big year in 2024. During 2023 we awarded both of our major funding streams across 24 new projects. Keep an eye on our channels to find out how these projects are progressing.

If you'd like to learn more about anything you read here, please don't hesitate to get in touch with me at [JHorrocks@eqc.govt.nz](mailto:JHorrocks@eqc.govt.nz).



**Dr Jo Horrocks**

Chief Resilience and Research Officer



### **Our research priorities help guide our investment towards our resilience goal:**

**Empowering people** – helping New Zealanders understand their natural hazard risks.

**Quantifying risk** – quantifying the size, frequency and likelihood of hazards and their impacts.

**Smarter land use** – identifying hazardous land and advocating for risk-centred land-use management.

**Resilient buildings** – designing buildings that are more resilient to future events.

**Governance and economics** – ensuring costs associated with preparedness and recovery are understood and responsibly managed.

**Better together** – supporting people to be better prepared for natural hazards.





# EMPOWERING PEOPLE

Earthquakes, tsunamis, landslides, storms, and volcanoes – New Zealand is a country with natural hazards as varied as its landscapes. At EQC, we help New Zealanders understand their natural hazard risks, so that everyone can be empowered to make informed decisions that build greater resilience.

## Better data, better decisions

In 2023, we launched our Natural Hazards Portal (the Portal) – a website that makes it easier for New Zealanders to find information on settled natural hazard insurance claims (EQCover claims) on residential properties. The Portal also provides useful information and insights on natural hazard risks in our communities.

The Portal provides easy access to:

- local and national-level hazard risk information that is available from multiple government agencies, for example, council hazard maps
- information about natural hazards insurance, and
- a map which allows people to search for settled EQCover claims from 1997 onwards, on residential properties and land nationwide.

Since its launch in July until the end of 2023, more than 29,000 people have accessed the Portal, with over 9,400 download requests about specific properties.

The Portal is an evolving tool and, going forward, our vision is to create a ‘go-to source’ for natural hazard risk information in New Zealand.

We want to share the data and information that we, and others, have on natural hazard risk by translating it and making it useful and easily accessible to all New Zealanders. Our long-term goal is to empower people to understand their individual property-level risk and provide them with tools to help manage this.



**Sarah-Jayne McCurrach,**  
Head of Risk Reduction and Resilience

Sarah-Jayne McCurrach is a dedicated leader in natural hazard risk management in New Zealand. With over 18 years' experience, she currently leads EQC's Risk Reduction and Resilience team and work programme, which has a focus on advocating for evidence-based, risk-informed policy and decision making. Passionate about the translation and use of science in policy and practice, she strives to enhance our governance and planning for natural hazards, and ensure our communities have the information they need to feel empowered and encouraged to reduce natural hazard risk.

Sarah-Jayne's leadership roles have included chairing national and international working groups and representing New Zealand in hazard risk management governance internationally. She has initiated, led and managed numerous, successful risk management initiatives in New Zealand. Most recently she directed the development of the Natural Hazard Portal, led the creation of EQC's Risk Tolerance Framework and collaboration with the Ministry for the Environment to develop national guidance and strengthen policy for the management of natural hazard risk.



NATURAL HAZARDS PORTAL CLAIMS MAP



NATURAL HAZARDS PORTAL

“

Having easy-to-access information and data on natural hazards helps us understand risks, potential impacts and how we can better plan and prepare, so our whānau and whenua have a safe and resilient future.

**Sarah-Jayne McCurrach,  
Head of Risk Reduction  
and Resilience at EQC**

## Investing in mātauranga Māori

This year, EQC launched the Te Ao Māori strategy to help guide our ambition to be a trusted and valued agency by Māori. As part of that, in 2023, we continued to grow our investment in mātauranga and kaupapa Māori research that holds Māori values, knowledge and traditions at its heart. Below are just a couple of examples of exciting research in this space.

## Partnership to support mātauranga Māori and natural hazard research

A research funding partnership has been established by EQC and Massey University to support Te Toi Whakaruruhau o Aotearoa, the Māori Disaster Research Centre initially developed with support from a 2020 EQC University Research programme grant. Te Toi Whakaruruhau is led by the Kaiwhakahaere (Director) Dr Christine Kenney, Professor of Disaster Risk Reduction at Massey University.

The Centre aims to develop Māori disaster research capability and mātauranga Māori, while creating appropriate linkages with science to inform iwi, whānau and hapū, EQC, government and practitioners' decisions and policy making. Increasing Māori participation in the disaster risk reduction (DRR) sector and creating mātauranga Māori-informed approaches to assess and manage hazard risks are key priorities.

Connections have also been made with local Māori and Indigenous collectives internationally active within DRR and disaster research. These developing relationships underpin future collaborations to ensure Indigenous disaster and hazards research initiatives are well-aligned and effectively serve communities in New Zealand and abroad.

EQC values the Te Toi Whakaruruhau partnership as it aligns with our Resilience Strategy 2019-2029 and focuses on mātauranga Māori participation in the DRR sector.



TE TOI WHAKARURUHOU FIELD TRIP IN THE MANAWATŪ GORGE



NOHO MARAE

## Māori-centred disaster preparedness resources

Funded by a 2022 EQC Biennial Grant, Kristie-Lee Thomas and Brandy Alger from the University of Canterbury, community contractors Anne-Marie and Benoir Midwood-Murray, and Lucy Kaiser from GNS Science/Massey University Joint Centre for Disaster Research, together with whānau of Te Kapa o Te Rangīiti ki Oruanui, Te Rūnanga o Ngāi Tahu Whānau & Emergency Response Team, Te Rūnanga o Moeraki and Activate Agency have formed two pilot projects in Taupō and Moeraki to create Māori-centred disaster preparedness resources.

Several wānanga have been held to explore mātauranga, available science, existing resources, information needs and to create resources desired by whānau. Māori creatives from Taupō and Moeraki are leading resource design, creation and dissemination with their communities. These pilot projects will be completed by mid-2024 and learnings documented to inform future development of Disaster Risk Reduction for Māori whānau and their communities.



**Hema Wihongi**  
(Ngāpuhi, Te  
Rarawa), Senior  
Research  
Advisor Māori |  
Kaitohutohu

### Matua Mātauranga Māori

Hema supports our funded researchers to engage with iwi and hapu in culturally appropriate ways.

Hema has an applied background in environmental studies and master's in technology futures. Over the past two decades she has represented Māori at UN fora and co-led the progression of the Wai 262 inquiry (the flora, fauna, and cultural intellectual property claim). Her priority is the urgent need to protect, preserve, and promote the appropriate use of taonga and mātauranga Māori, and the drafting of legislation to give effect to the sui generis framework (an independent legal classification) for the protection of taonga Māori.

Hema takes a very long-term view of resilience and risk and is passionate about preparing New Zealand for the next 5,000 years of natural hazard events.

### Travelling to the birthplace of cyclones and storms

In 2023, EQC's Senior Research Advisor Māori, Hema Wihongi was invited to speak at the Indigenous Language Summit hosted by the University of Guam Micronesia, entitled "It's Never Too Late." She presented on protecting and interpreting traditional knowledge for the preservation and recovery of cultural heritage.

While there, she also met the Head Navigator in Guam, attended a sacred ceremony and heard traditional stories of the over 10,000m deep Mariana Trench.

According to traditional knowledge, Micronesia is the birthplace of all cyclones and storms that occur in the Pacific. The people Hema met shared with her how traditional homes were designed and built on top of tall stone pillars adapted to overcome ocean surges and prevent villages from being swept away. Micronesia continues to deal with geo-political and socio-economic challenges, ranging from militarisation, climate change, health and domestic violence.



ATTENDING THE INAUGURAL BOARD MEETING FOR THE PACIFIC INDIGENOUS WOMEN'S NETWORK IN CHUUK, IN MICRONESIA, HEMA AND HER COMPANIONS WERE WELCOMED BY THE CHUUK WOMEN'S CENTRE



HEMA AT THE INDIGENOUS LANGUAGE SUMMIT

## Simplifying hard-to-have conversations

More and more, local governments across New Zealand are engaging with their communities about climate change and natural hazard risks. Good engagement is challenging, but it's critical to ensuring decisions about risk meet community needs, their risk tolerances and expectations.

The EQC-funded "Let's Talk About Risk" project led by Dr Charlotte Brown from Resilient Organisations and independent social researcher Dr Margaret Kilvington supports local government practitioners to have these conversations.

The project has culminated in a new framework for engagement practitioners, freely available through the Resilient Organisations website, which includes best practices and practical tips for community engagement.



THE "LET'S TALK ABOUT RISK" TEAM AT A CONFERENCE; LEFT TO RIGHT: DR MARGARET KILVINGTON, EVALUATION AND FACILITATION, DR CHRYS HORN, SOPHIE HORSFALL, AND DR CHARLOTTE BROWN WITH BABY NOA.

## Do people who live in regions less prone to earthquakes prepare for them?

Dr Lauren Vinnell from the Massey University's Joint Centre for Disaster Research seeks to answer this question to help create better public education campaigns.

Focusing on the Auckland region, the EQC-funded researcher ran a survey into Aucklanders' earthquake awareness and preparedness. She found that while earthquakes are the natural hazard risk at the forefront of Aucklanders' minds, those who had experienced recent severe weather events were less likely to think about earthquakes and perceived their risk to be lower.

The next step is to conduct focus groups with councils, emergency managers, iwi and Pasifika groups to drill into some of the survey findings, including how Aucklanders prefer to receive earthquake information.



DR VINNELL PLANNING LOCATIONS FOR THE SURVEY ON PERCEPTIONS OF SEISMIC HAZARD IN THE AUCKLAND REGION

## Preparing for earthquakes in the Catlins

Dr Vinnell's findings will also benefit people living in other parts of New Zealand who face lower (but still significant) earthquake risks – such as communities along the Settlement Fault in the Catlins in Southland.

Research led by Otago University's Professor Mark Stirling is looking for evidence of prehistoric earthquakes to determine how quickly the Settlement fault is moving, which will predict its future behaviour and give an idea about the levels of ground shaking the earthquake will cause in the future.

“

Although there are lots of active faults across New Zealand, most of our focus is on high seismic areas. It's important to have data in low seismic areas too, to develop our understanding of countrywide natural hazards. These projects build a regional perspective of how faults behave and vary over time.

**Dr Natalie Balfour, Head of Research at EQC**



PROFESSOR MARK STIRLING AND TEAM SURVEYING A FRESHLY DUG TRENCH

## Empowering researchers to communicate their science

We support researchers to communicate their science in ways that are accessible to more New Zealanders.

In 2023, we held three science communication webinars covering storytelling, data visualisation and mātauranga Māori. These expert-led webinars were well attended by researchers from a range of institutes across New Zealand, with over 150 participants across all the sessions.

Participants told us that they found the sessions useful, practical, and especially appreciated the ‘fantastic’ speakers.

“

Superb workshop.  
Extremely useful for any  
researcher, at any level.

**Science communication  
webinar participant**



### Dr Natalie Balfour, Head of Research

Natalie has a PhD in seismology and a strong interest in generating and using research and data to understand natural hazard risk. She helps direct the millions in annual funding that EQC invests in natural hazards research. Prior to joining EQC, Natalie worked at GNS Science where she was involved in the management of GeoNet. Earlier in her career, she helped build the Australian Seismometers in Schools Network and has lectured at universities.

We also work with our funded researchers to get their science into the media and other channels. Our 2023 highlights included a story on 1News about Professor Martha Savage’s research into offshore earthquakes in the Hikurangi subduction zone and a feature on RNZ on Professor Anthony Hōete’s research into ancient Māori building techniques, which were proven to withstand major earthquakes. Both of these projects were funded in our 2022 Biennial Grants round.



**Dr Emma Hudson-Doyle, Senior Advisor Science Communication**

Emma has been supporting science communication at EQC since 2021, including through launching and coordinating the science communications webinars. Emma works part-time at EQC and the rest of her time is spent at the Joint Centre for Disaster Research at Massey University,

where she is an Associate Professor and co-leads (with Saskia de Vilder, GNS Science) the Endeavour project 'Hōretireti Whenua Sliding Lands' which seeks to develop nationwide landslide models that can best inform decision-making. Her interests lie at the interface between physical science and critical decision-makers, with a primary focus on the communication of science advice and uncertainty associated with natural hazard events.



PROFESSOR MARTHA SAVAGE ON 1NEWS

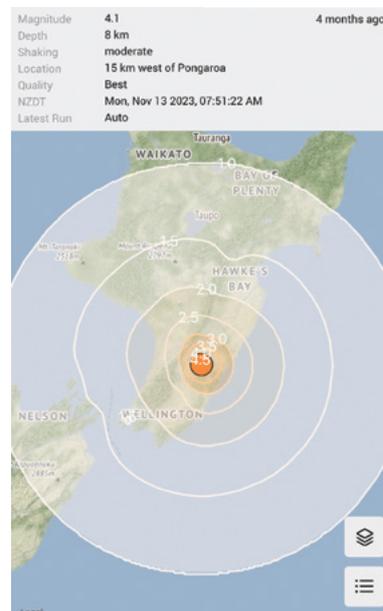


# QUANTIFYING RISK

New Zealand is one of the riskiest places on earth for natural hazards<sup>1</sup>, but understanding their severity and likelihood can help us prepare for their impact. EQC supports modelling of natural hazards and their impacts, and contributes to projects that generate data which helps New Zealanders make decisions about managing risks and preparedness.

## GeoNet gets shake up

In 2023, GNS Science released “Shaking Layers” – maps which show the level of ground shaking at specific sites following an earthquake. This is often a more useful metric of an earthquake than the magnitude, which represents the energy released at the earthquake’s centre.



EQC use this information for our events-based loss modelling. Previously we have used ad hoc versions created by GNS Science or overseas agencies, so it’s great to now have an New Zealand-specific and fit-for-purpose product that can be directly incorporated into our loss modelling platform, PRUE, immediately following an earthquake.

SHAKING LAYERS MAP OF PONGAROA 4.2M EARTHQUAKE/ COURTESY OF GEONET

1 According to 2018 study Llyod’s of London: A world at Risk, New Zealand is the fourth riskiest country in the world when it comes to natural hazards.

## New dashboard helps with planning for recovery

RiskScape is an open-source natural hazard modelling tool for multi-risk analysis, built by GNS in partnership with NIWA and EQC. The highly customisable tool lets risk managers create tailored risk scenarios, helping support sound decision-making around impacts of natural hazards.

In 2023, we helped launch the Risk Adaptation Dashboard (RAD), a microsite hosted on the RiskScape platform which supports the translation of modelling for decision-making.

A key example of this is the adaptation tool, which allows users to explore how different modelled policy interventions may influence their decisions on managing future multi-hazard risk.

For example, a user can apply a policy intervention to a selected building (e.g., raise the floor height) and then re-run the risk model and see how this changes their potential future losses.



### Janette Merlo, Research Advisor

Janette has a background in risk management from the University of Colima, Mexico, and a master's in seismic engineering from University Institute for Advanced Studies (IUSS) Pavia, Italy. Drawing on her background in these two areas, she shares the team's dedication to disaster risk reduction. She excels in contract, financial, and project management, while championing organisational culture and research dissemination. Her expertise spans risk management, social sciences, and seismic engineering. Janette supports EQC-funded social science researchers studying natural hazards to deliver maximum and long-term benefits to New Zealanders from their work.

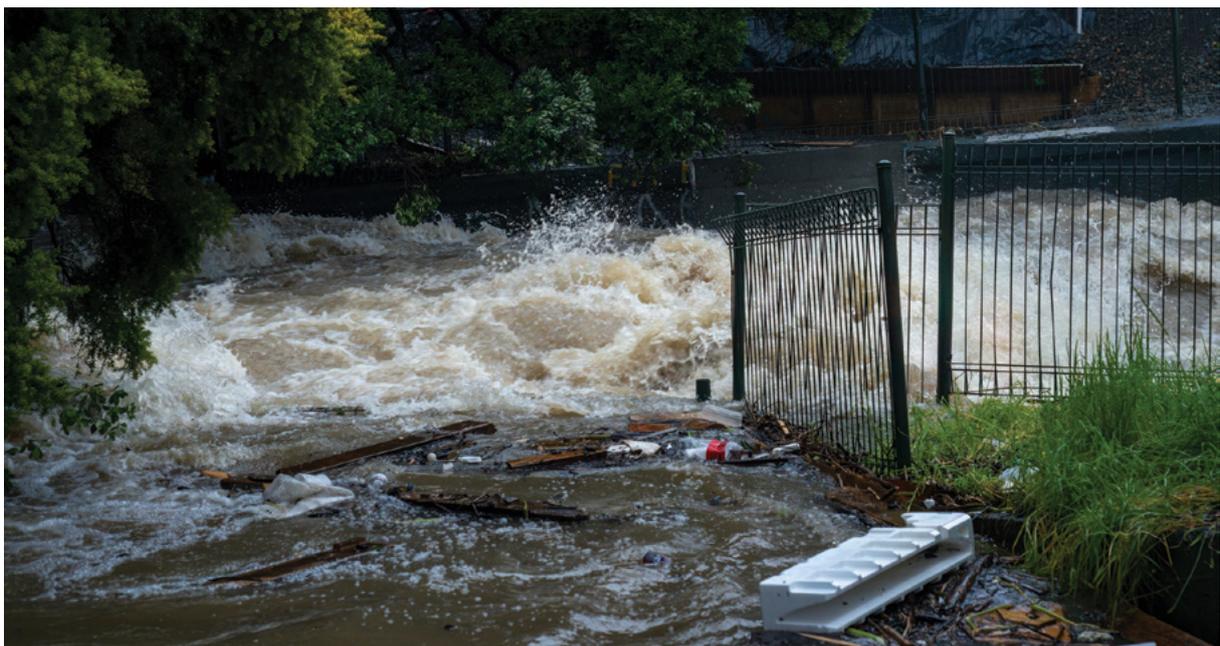


IMAGE FROM CYCLONE GABRIELLE

## Elaine Smid, DEVORA Project Manager

DEVORA (DEtermining VOLcanic Risk in Auckland) is an EQC co-funded research programme led by GNS Science and University of Auckland volcanologists which brings together scientists with emergency managers, planners, and infrastructure providers to understand the impact of volcanoes on Auckland.

It's one of our longest standing investments, and each year the funding supports projects spanning a variety of research fields that help quantify Auckland's volcano risk.

One of the people integral to DEVORA's success is Elaine Smid. Elaine manages the DEVORA research programme and actively researches the Auckland Volcanic Field (AVF) as part of her PhD from the University of Auckland.

Elaine was one of the first people to join DEVORA when it launched in 2008. Since then, she's seen it grow in impact and value.

Now, the programme covers research into everything from geological aspects of the AVF to hazards, geo-heritage, legal frameworks and volcanic risk, while also leading public education programmes to

ensure its research is understood and useful to a wide audience.

With the frequency and intensity of natural hazards events growing, Elaine says creative and inclusive research approaches like DEVORA are more important than ever.

“We must invest time and funding now, and on an on-going basis, to make everyone safer in the long-term. I've seen first-hand how rapidly our understanding of how to manage a volcanic eruption can advance with a relatively low but consistent investment from involved partners such as EQC and Auckland Council.”

Elaine says that her colleagues overseas have also recognised DEVORA's value.

“

Programmes like DEVORA should be a point of pride for New Zealanders, as they place us as a leader on the world stage in this space.

**Elaine Smid, DEVORA Project Manager**



ELAINE WORKING IN THE FIELD

## New ways of quantifying hazard

EQC invests in new technologies and techniques that measure the severity, impact and frequency of natural hazards in innovative ways.



DR CALUM CHAMBERLAIN

One example is a project led by Dr Calum Chamberlain from Victoria University of Wellington using AI technology to map unrest under Auckland. Because earthquakes can

be a precursor to an eruption, it's important to have a clear picture of baseline seismic activity so anything out of the ordinary can be quickly noticed. However, most earthquakes are often too small to be picked up by traditional methods.

Supported through one of our Biennial grants, Dr Chamberlain is applying advanced AI technology to data gathered through traditional sensors.

So far, the team has detected and located 10 to 15 times more earthquakes than reported through GeoNet!

## Scenarios bring hypothetical events to life

Developing and using credible natural hazard scenarios based on science, historical events or other evidence is a tried-and-true way to better understand the potential impacts of different natural hazard events. At EQC, we use either existing scenarios, or develop new ones, to help us understand and improve how we work with our insurer partners and different levels of government on hazard risk reduction, response and recovery.



LLOYD HOMER GNS SCIENCE



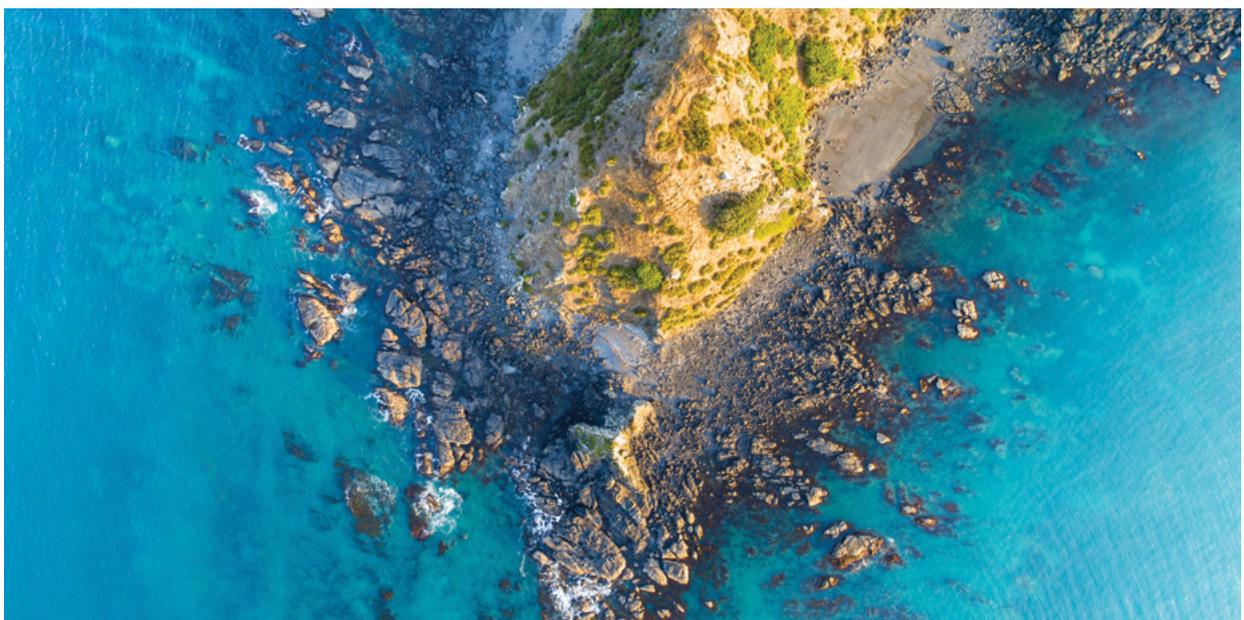
**Dr Alistair Davies,  
Manager Risk  
Reduction and  
Resilience**

Ali started out studying geography at the University of Cambridge. He worked in a flood risk consultancy in the United Kingdom, before coming to New Zealand to do his EQC-funded PhD on disaster risk and resilience at the University of Canterbury. He then moved to the National Emergency Management Agency before joining EQC. Ali has experience across the Risk Reduction & Resilience and Event Readiness teams in EQC and has contributed towards the development of the Natural Hazards Portal, natural hazard scenarios, and regularly collaborates with central government and academics to translate science into policy.



We use scenarios to educate about how natural hazards can impact residential property, and inform conversations about increasing resilience for, and recovering from, natural hazards. Scenarios are a proven communication tool that enable collaboration to reduce disaster impacts. The story-like nature of scenarios enables input from people across EQC, ensuring we harness our broad range of expertise.

**Dr Alistair Davies, Manager  
Risk Reduction and Resilience**







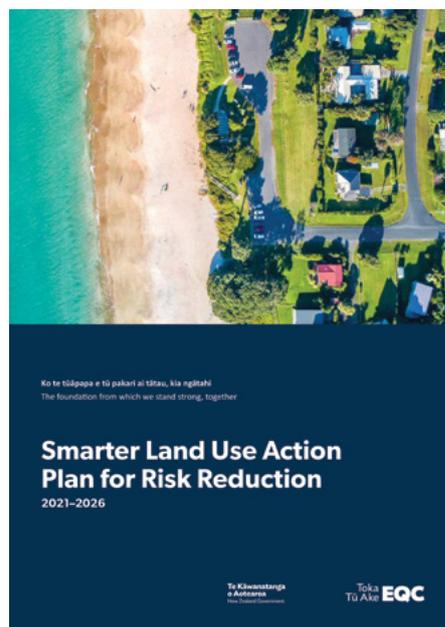
# SMARTER LAND USE

Natural hazard land use planning, practices and policies are key to a resilient New Zealand. As well as funding research that identifies hazardous land, EQC actively engages with government and industry to support, influence, and enable evidence-based decision-making around land use at the national and local levels. Our mantra is ‘stronger homes built on better land’.

## Highlights from the third year of the Smarter Land Use Action Plan

2023 was the third year of progressing the Smarter Land Use Action Plan for Risk Reduction. The goal of the Action Plan is to take a proactive approach to reducing current and future risks through smarter, risk-based land use planning. Three objectives underpin this Action Plan:

1. Provide leadership in land use planning for natural hazard risk reduction.
2. Encourage and support risk-based planning solutions based on knowledge and understandings.
3. Build capability and capacity to reduce risks over time.



For 2023, the key actions in the plan that were progressed included submitting on central and local government bills, policies and plans; the development and implementation of our risk tolerance methodology; and other engagement with government which you can read about in this section.

THE SMARTER LAND USE ACTION PLAN FOR RISK REDUCTION

## Collaboration with central government

One activity in the Smarter Land Use Action Plan is to contribute to national policy development. During 2023 we have provided valuable subject matter expertise to the Ministry for the Environment on natural hazards and land use planning.

We extensively contributed to the proposed National Policy Statement for Natural Hazard Decision Making and have continued to support the Ministry with other national direction initiatives. The opportunity has strengthened our important relationship with the Ministry and highlighted the benefits of working together.



EQC INPUTS INTO CENTRAL AND LOCAL GOVERNMENT POLICY DEVELOPMENT



**Dr Wendy Saunders,  
Principal Advisor Risk Reduction and Resilience**

Wendy is EQC’s champion of land use planning. Since her PhD on risk-based land use planning, she has worked with councils and central government to develop and implement their risk-based planning policies. Previously at GNS Science she worked with scientists to translate their research into planning practice. At EQC, she leads the Smarter Land Use Action Plan with a focus on how better land use planning can reduce natural hazard risk.

## State of Australasian Cities

For the first time in its 20-year history, the State of Australasian Cities (SOAC) conference was held in New Zealand at the Victoria University of Wellington. We sponsored the flagship event, which brought together over 400 people within the Australasian Cities Research Network to share and discuss the latest research.

Our Principal Advisor Dr Wendy Saunders led a panel discussion on the impacts of research on policy-making.



DR WENDY SAUNDERS PRESENTING AT SOAC 2023

## Industry partnerships

Partnering with influential industry bodies such as Te Kōkiringa Taumata New Zealand Planning Institute (NZPI) is an important way we champion smarter land use planning.

NZPI represents over 3000 members of the planning profession and advocates for the best possible system to manage land use while protecting the environment. We share a vision for land-use planning that is resilient and reduces natural hazard risks.

Through a yearly sponsorship, we support NZPI activities that improve planning practice in relation to managing natural hazard risks, enabling the Institute to upskill its members,

hold conferences and programmes, input into government policy and tertiary education.

One example of the funding in action is NZPI's of a professional development programme that aligns with our Smarter Land Use Action Plan. The programme will help planners develop and implement tools and policies to inform, support and empower decision-making when considering natural hazards.

We continue to look for opportunities to work with NZPI and other industry bodies to strengthen planning for natural hazards.



WE WORK WITH INDUSTRY BODIES TO EFFECT CHANGE IN LAND-USE PLANNING

### **New guidance underway to identify land at risks of slips**

Homes and other infrastructure in New Zealand are sometimes located on steep landscapes, especially in urban areas, due to the lack of space for development and attractive views. These areas are vulnerable to landslips in the event of heavy rain or an earthquake. An increase in severe rainfall because of climate change is expected to exacerbate the issue.

With funding support from EQC, the New Zealand Geotechnical Society is developing guidelines to help geotechnical practitioners identify, assess and mitigate landslip hazards.

The guidelines aim to improve future land use, as areas of potential instability will be identified earlier, and more rigorously assessed, allowing for better mitigation. They will also enable the effects of slope instability to be assessed to building code requirements with greater rigour, providing more certainty of performance under seismic conditions. The guidelines are expected to be released by the end of 2024.



A GEOLOGIST MAPPING A LANDSLIDE

## RiskScape for smarter land use

This year EQC funded case studies into how RiskScape, the powerful risk assessment tool we helped build, can be used to inform land use planning policy and decision-making.

The four case studies explored challenges encountered by planners, including greenfield development (previously undeveloped land that has been earmarked for urban development), policy intervention, future climate change risks and assessing risk thresholds.

The research and software code, released on our website earlier this year, is freely available for all councils to use for their risk assessments.



**Delia Tamsen,**  
Senior Research  
Advisor

Delia has a master's degree in physical geography and has worked in natural hazard research and research management, including Nō Mātou Te Hapa It's Our Fault, the collaborative research programme studying Wellington's earthquake hazard and risk. She is currently doing her PhD looking at the role of science in disaster risk reduction policymaking. Delia works across the smarter land use research portfolio to help ensure EQC's research investments are well-supported to deliver increased resilience for New Zealand.



THE CASE STUDIES TOOK PLACE IN AUCKLAND BUT CAN BE APPLIED TO OTHER REGIONS ACROSS NEW ZEALAND

## Championing risk-based land use

EQC writes submissions on government policy proposals and council plans that are most relevant from a natural hazard risk reduction perspective, and where we think the greatest change is needed.

Keeping homeowners' interests front of mind, we champion policies and practices that limit damage to homes resulting from potential natural hazard events. Often, we use evidence and data that we helped to fund in our submissions.

In 2023, there were many proposed changes to council plans to give effect to central government policies which make it easier to build homes in urban centres. Our submissions helped ensure that this is done responsibly, keeping risk reduction in mind.

We submitted on seven local and regional council plan changes in 2023 and had several meetings with councils on plans we submitted in 2022 – a positive sign that our submissions are having an impact.

We also made submissions on central government policies, including the Spatial Planning Bill and the Natural and Built Environment Bill, and attended a select committee for these two bills to advocate for our submissions.

An external review of our submissions deemed them to be relevant, sound, evidence-based, and clear.



**Dr Tabitha Bushell, Senior Advisor Risk Reduction and Resilience**

Tabitha Bushell studied geology at the University of Auckland and in 2021 completed a PhD looking at faults which ruptured in the 2016 Kaikōura earthquake. She began working at EQC soon after studying as she was keen to see how her technical knowledge could be translated into real-world gains in risk reduction and resilience. She has since been delving into the challenges of translating natural hazard science into policy, particularly at the local government scale, and trying to promote better communication between scientists, policymakers, and the public. She is passionate about smarter land use, community resilience, and open and well-communicated science.



# RESILIENT BUILDINGS

Homes that can withstand natural hazards are essential to a resilient New Zealand. EQC funds research that helps us understand why some buildings fail and how to make them more resilient to future events. We also invest in understanding society's needs and expectations when it comes to the build environment, and advocate for these values to be reflected in building codes.

## Action plan for resilient homes and buildings

Our five-year Resilient Homes and Buildings Action Plan sets out where we view the biggest opportunities to improve the built environment and how it can be most effective in working towards those goals with key partners. It was published in 2022 and compliments our Smarter Land Use Action Plan.

The Resilient Homes and Buildings Action Plan has three overarching objectives:

- Raising the bar for our new builds
- Managing the worst risks in our existing buildings
- Ensuring the built environment system enables more natural hazard resilience.

In 2023, the plan has fed into the development of the Natural Hazards Portal, as well as several guidelines for design practitioners currently in development, including the Low Damage Seismic Design guidelines and the Whole-of-Building Retrofit guidelines.

THE RESILIENT HOMES AND BUILDINGS ACTION PLAN WAS RELEASED IN 2022



Ko te tūāpapa e tū pakari ai i tētahi, kia ngātahi  
The foundation from which we stand strong, together

### Resilient Homes and Buildings Action Plan

2022-2027

Tu Kāwanatanga  
o Aotearoa

Tōka  
Tū Ake  
EQC



## Caleb Dunne, Principal Advisor Risk Reduction and Resilience

Caleb is a licensed professional engineer from California. After practising as a structural engineer, a passion for risk reduction led him to New Zealand, where he thought people might know a few things about disasters. He completed a Master of Disaster Risk and Resilience and postgraduate studies in earthquake engineering at the University of Canterbury, and now leads EQC's work improving the resilience of the built environment through research, practice and policy, including the Resilient Homes and Buildings Action Plan.

## How do Kiwis want buildings to perform during and after an earthquake?

The Resilient Buildings Project is an unprecedented effort to capture a snapshot of New Zealand society's expectations and tolerance towards earthquake risk – ultimately to inform future performance objectives for new buildings.

The project was initiated and led by the New Zealand Society for Earthquake Engineering with funding support from EQC. Resilient Organisations co-led the social research. The project team included members selected for different skill sets and experience including social science, structural engineering practice, research and code writing, economics, insurance, risk governance and public policy.

Historically, building performance objectives have been framed by technical experts. For the first time in New Zealand, researchers set out to find out nationwide societal expectations for seismic performance of buildings through interviews and focus groups.

The team found that:

- Kiwis want more than life safety – when New Zealanders were asked how they want buildings to perform during and after an earthquake, they found that:
  - o Life safety is non-negotiable
  - o Kiwis want more than life safety. In particular, social and economic recovery are important objectives.
  - o Speed of recovery is a particular priority for some building types, such as marae, community centres and homes.
- With the growth in working from home, increasingly people will want more than just to shelter in place.

## Building performance is linked to wellbeing

The project developed a framework to map these social expectations onto building performance. It maps key dimensions of building performance like life safety, loss of function as well as protection from property damage onto longer-term social, economic and environmental outcomes. The project also provides a way to categorise building types and identify why some building and usages are particularly important to people within the building performance framework.

## Gaps in the current code

Using the framework, the team found Kiwis' expectations for life safety is largely catered for within the current code settings but there was a gap in other dimensions of building performance. Kiwis want a significantly increased focus on reducing loss of function and protecting property by delaying the onset of damage and reducing its consequences overall.

## Design tool to close the gap

The framework is a powerful tool that can be used to guide changes in design practice in New Zealand's seismic standards and codes.



PROJECT CO-LEADER HELEN FERNER PRESENTING AT NZSEE

It is not prescriptive, is agnostic about what level of building performance is required and how it may be achieved, can be used for all building types and usages and is outcomes- focused.

## Looking ahead

In 2024, the Resilient Buildings Project team will focus on communicating the outcome of the study to key stakeholder groups and working with government and industry to advocate for implementing these findings into policy and practice.



PROJECT CO-LEADER DR CHARLOTTE BROWN



THE RESILIENT BUILDINGS PROJECT LED FOCUS GROUPS ACROSS THE COUNTRY

## Prestigious award will further improve building practices

Structural engineering lecturer Dr Lucas Hogan from the University of Auckland won the prestigious EQC/NZSEE Ivan Skinner Award this year for his natural hazard research which has changed building practices in New Zealand.

During his career, Dr Hogan has helped NZTA better understand the seismic resilience of bridges across New Zealand and assisted with Urban Search and Rescue (USAR) efforts following the Auckland floods and Cyclone Gabrielle.

He's also helped change engineering practices after highlighting vulnerabilities in the way concrete walls are connected to foundations in common warehouse buildings.

But Dr Hogan is most proud of his work on the ReCast project, which led to improved assessment and strengthening of concrete floors across the country, after showing that most floors would not hold up in an earthquake.

He plans to use the prize money to share his expertise with peers to shape building guidelines in the USA.



IVAN SKINNER AWARD-WINNER DR LUCAS HOGAN (LEFT) WITH CHIEF ENGINEER FOR EQC AND PROFESSOR KEN ELWOOD (RIGHT)



### Dr Helen Sargent, Senior Research Advisor

Helen has a PhD from the University of Queensland in plant improvement that led to a biotech start-up company. She has since worked in research, business development, commercialisation and operations-related roles in Australia, USA and New Zealand. Her sector experience includes both life and physical sciences, engineering, data & IT and social sciences. Helen previously worked at Victoria University of Wellington and GNS Science, before joining EQC’s Research Team in January 2022. Helen helps funded researchers working in the resilient buildings space shape up their projects towards greater impact for end users.

### Research may impact concrete wall construction

Researchers at the University of Canterbury are conducting earthquake testing to better understand the performance of a construction technique called ‘staggered lap splices’, which is used to connect the steel bars in reinforced concrete walls to the steel bars coming out of the foundations.

By attaching walls to machines which mimic the effects of a major earthquake, the researchers are looking at how much the wall can deform before it collapses.

Initial results show that staggered lap splices cause damage to concentrate at the base of the wall, making it more likely to break in an earthquake.

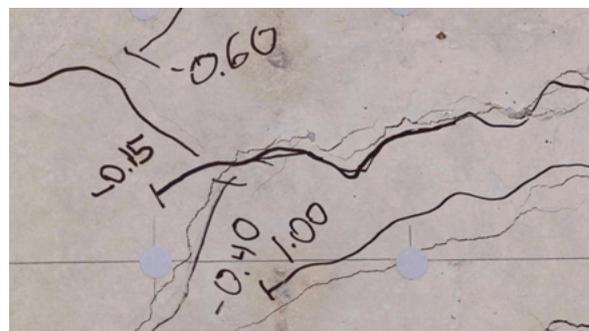
In fact, walls with staggered lap splices may be at least as vulnerable to earthquake damage as other techniques banned in New Zealand for being too risky.

The next experiment will test an alternative to lap splices, namely mechanical coupling of steel reinforcement.

Professor Santiago Pujol, who is leading the EQC-funded work, says the research will provide vital new insights to inform engineering and construction standards – not only putting the problem in the spotlight, but also offering solutions for the industry by designing and testing alternative configurations.



PROFESSOR SANTIAGO PUJOL DISCUSSES THE WALL TESTS WITH PHD CANDIDATE CHARLIE KERBY AT THE STRUCTURAL ENGINEERING LABORATORY AT THE UNIVERSITY OF CANTERBURY



THE LINES MARK THE CRACKS AFTER THREE DAYS OF SEISMIC TESTING ON THE CONCRETE WALL

## Earthquake secrets in the soil

University of Canterbury's researcher Felipe Kuncar is working on a ground-motion simulation model that will improve understanding of how different Christchurch neighbourhoods are impacted by shaking. Different soils respond differently in earthquakes, with buildings on softer soil experiencing more shaking than those on more solid ground.

The EQC-funded research focuses on Christchurch to start, which has a dense network of motion sensors, and will combine data from frequent, small earthquakes with data from larger earthquakes to get a complete picture of ground shaking at a local level.

Kuncar is currently finalising a research paper comparing different methods for incorporating soil responses in ground-shaking simulations.



FELIPE KUNCAR PRESENTING HIS WORK AT LAST YEAR'S QUAKECORE ANNUAL MEETING

Likewise, despite a one-fits-all approach to the building code, different parts of Wellington shake at different intensities during an earthquake. EQC funding enabled University of Canterbury's Professor Brendon Bradley and his team to explain why so many of Wellington's buildings suffered significant damage during the Kaikōura earthquake.

They found that, in certain places, the soil amplifies shaking over a narrow range of frequencies that specifically affect 10-storey buildings but 20-storey buildings a lot less. In other locations, the opposite was true.

Both researchers' findings can help engineers design and assess buildings which more accurately predict how the ground and buildings could behave in future earthquakes.



RESEARCHERS FROM THE UNIVERSITY OF CANTERBURY USE A SLEDGEHAMMER TO CREATE VIBRATIONS WHICH ARE RECORDED BY THE SENSORS TO DETERMINE THE COMPOSITION OF THE SOILS BELOW







# GOVERNANCE AND ECONOMICS

New Zealand is one of the most insured countries on Earth, thanks in part to our good relationship with reinsurers. Our data and loss modelling capabilities, as well as investment into research looking at costs associated with preparedness and recovery, go a long way toward giving reinsurers confidence that New Zealand is doing everything possible to prevent natural hazards from becoming disasters.

## Cash settlements and quality of housing

Damage to houses following a natural hazard event is covered by a combination of private insurance and EQC, with cash settlement being the preferred way to resolve insurance claims.

In 2023, we published a major research report looking at the impacts of cash settlement on the long-term quality of housing stock.

Researchers from Resilient Organisations, Tonkin + Taylor and Kestrel Group used the 2016 Kaikōura/Hurunui earthquake as a case study. The team found that most (85%) of claimants chose to repair their properties, and a large minority (42%) opted to undertake the work themselves, which raised questions around quality. However, 82% of claimants were satisfied with the quality of their repairs.

The report also showed the importance of access to information to support claimants, quality damage assessment processes, and repair quality assurance processes. Autonomy and choice in the repair process were highly valued by claimants.

While there is no clear-cut answer as to whether cash settlement is the best pathway, the research provides valuable insight into how insurers can support claimants following a natural hazard event.

At the end of 2023, Resilient Organisations received an EQC Biennial grant to continue the research, comparing outcomes in different community settings.



THE RESEARCH LOOKED AT WHETHER CASH SETTLEMENT IMPACTED THE QUALITY OF HOUSING STOCK IN NEW ZEALAND

## Are tribunals a good method of dispute resolution?

Following a natural hazard event, dispute resolution needs to be accessible, inexpensive, and quick to support communities to recover and rebuild.

During the Canterbury earthquakes, it became apparent that using courts as the 'go-to' for dispute resolution was problematic as they were quickly overwhelmed with an enormous number of cases. In response, the government introduced the Canterbury Earthquakes Insurance Tribunal (CEIT) to provide an informal, inexpensive and quick alternative to the courts.

Tribunals are a new dispute mechanism in post-disaster recovery in New Zealand, and their effectiveness is unproven. Dr Toni Collins from the University of Canterbury is using the CEIT as a case study to understand its effectiveness in a post-disaster environment.

The findings so far suggest an alternative to the court system which gave claimants another option to resolve disputes was the right approach but it should have been established much sooner - eight years after the earthquakes was "too little too late" with the bulk of disputes having already been channelled through the courts.

In the next stages of the project, Dr Collins will interview CEIT officials and lawyers to understand the practical effectiveness of its operations and conduct a comparative study of the use of tribunals in international post-disaster environments.

These findings will provide an evidence-based analysis of the CEIT and its ability to deliver user (and human-rights) driven dispute resolution. The conclusions can feed into decisions on how to manage post-disaster dispute resolution for future disasters.



DR TONI COLLINS, IMAGE COURTESY OF QUAKECORE

### **Cost of resilient buildings lower than expected**

Current earthquake performance standards in New Zealand primarily focus on preventing building collapse, but recent events like the Canterbury earthquakes have highlighted the need for more resilient structures that remain operational post-quake. Engineers in New Zealand have the knowledge and skills to build more resilient structures, but this is often perceived to be too costly.

Research led by Dr Enrique del Rey Castillo from the University of Auckland, and funded through EQC, probed this assumption and found it to be incorrect.

The researchers found that the cost implications of increasing seismic resilience is minimal, especially considering the total cost of a development project. Based on this, they recommend that New Zealand should move towards stiff and damage-resisting structures using well-understood structural systems like reinforced concrete (shear) walls.



DR ENRIQUE DEL REY CASTILLO BY CHRIS LOUFTE

### **Review shows increasingly diverse research portfolio**

To help others understand trends in EQC-funded research we released a new report, the Research Portfolio Review, looking back at three years of our research portfolio, from the introduction of our Resilience Strategy in 2019 through to 2022.

The report, which is available on our website, shows that we've been actively diversifying our portfolio from a traditional geosciences and engineering focus, to include more social science, economics, land-use planning, as well as mātauranga Māori and climate change research.

It also shows increasing investment into modernising our loss modelling capability and supporting risk reduction activities, as well as supporting researcher capability development.

We plan to undertake reviews like this every few years, to align with updates to our organisational strategies.



WE ARE DIVERSIFYING OUR RESEARCH PORTFOLIO BEYOND TRADITIONAL GEOSCIENCES AND ENGINEERING



### **Livvy Harris, Advisor Risk Reduction & Resilience**

Livvy has a background in geography and sociology. She has also recently completed her master's, which involved developing an agent-based model to investigate tsunami evacuations. Livvy has a passion for disaster risk reduction and is currently in the Risk Reduction and Resilience team on secondment from EQC's Event Readiness team. During her secondment she will be working on implementing the Risk Tolerance methodology and submissions.

## **Measuring how much risk we can tolerate**

This year, we launched a Risk Tolerance Methodology to support central, regional, and local government agencies who manage natural hazard risks, and need to make robust and transparent risk-based decisions.

Risk tolerance is our willingness to bear risk. Understanding it helps us decide how to manage the potential impacts of hazards on the things we care about, such as our health, environment, and homes.

Up until now, there has not been a clear and consistent way to measure risk tolerance in New Zealand's otherwise well-established approach to natural hazard risk management.

We're now engaging with stakeholders at national, regional and local levels to introduce the methodology. It's already being used by several government agencies to support risk management, including by the Ministry for the Environment to develop a national direction on natural hazards.





# BETTER TOGETHER

Through our public outreach work, we aim to create a New Zealand that is better informed about natural hazards, and more prepared for their impacts. Using a combination of marketing campaigns, partnerships and sponsorships, we reach many New Zealanders every year to help them make their homes and communities safer, stronger and more resilient.

## The year of partnerships

2023 was a year that heavily focused on many of our key public education partnerships. These partnerships play a vital role in connecting important natural hazard information with local communities across the motu. We were pleased to be able to put many sponsorship agreements in place, including:

- **Te Papa Tongarewa** – 2023 marked 25 years of partnership between EQC and our national museum. A new three-year agreement will see our support continue for Te Papa’s exhibits and education outreach work. There are some exciting pieces of new work to come, so watch this space!
- **Auckland War Memorial Museum** – Another long-standing EQC partner with a focus on volcanic risk in our largest city. A three-year agreement will see us continue as the major sponsor of the Volcanoes! exhibits, with our support enabling a number of much-needed updates and development of new interactives.
- **Quake City** – 2023 marked our 10th year of support for Canterbury Museum’s Quake City exhibit. Quake City tells the stories of the Canterbury Earthquake Sequence and recently welcomed its 500,000th visitor. As the exhibit’s major sponsor for another three years, we will help to continue to tell the stories of the quakes, provide a free-entry weekend for locals, and expand its education programme.

- **AF8 and East Coast LAB** – Alpine Fault magnitude 8 (AF8) and East Coast LAB are local education programmes focused on the Alpine Fault and Hikurangi subduction zone hazards respectively. The programmes work closely together to enable better communication, collaboration and consistent messaging for natural hazard-focused public education. New three-year agreements for both partners will build on the success of previous EQC-funded activities, including collaborative and individual projects, with an increased focus on bilingual resources.



**Hamish  
Armstrong,  
Public  
Education  
Manager**

Hamish leads some of EQC’s most visible programmes of work from advertising campaigns to work with schools and museum partners. Hamish monitors public awareness of what to do to reduce natural hazard risk and is always looking for new ways to motivate people to reduce their risk at home.

## Survey says Kiwis’ awareness of natural hazard risks trending up

Each quarter, we run a survey to understand what New Zealanders think and know about natural hazards, and the role of EQC in reducing their hazard impact and aiding recovery. The survey helps us understand what’s working in our public outreach activities, and where we need to focus our attention.

The latest results from the end of 2023 show that people’s awareness of natural hazard risk continue to trend upwards, with increases across the board from 2022. They suggest that the vast majority (90%) of New Zealanders consider natural risks when buying a new property. 54% of home buyers also rated natural hazard risk as ‘a very important consideration’ – a 7% increase from 2022. Most (70%) know that they can take action to make their homes safer and stronger in an earthquake, and many homeowners (60%) have already taken a number of key actions we support.

However, many challenges remain for public education to address. Awareness of our insurance role has declined since the time of the Canterbury Earthquake Sequence and there is confusion about our role in disaster response and recovery. Inspiring risk reduction actions on scale is also a difficult task, particularly when households are managing competing priorities, including challenges around cost of living.



WHILE AWARENESS IS TRENDING UP, THERE ARE MANY CHALLENGES FOR PUBLIC EDUCATION TO CONTINUE TO ADDRESS

## Inspiring new parents to protect their tamariki

Our regular research through NielsenIQ shows that protecting loved ones from harm or injury is the main reason New Zealanders want to make their homes safer and stronger against natural hazards. Young children, and babies in particular, are more vulnerable during natural hazards like earthquakes, because they're less able to take Drop, Cover, Hold actions that will help protect them from harm.

As such, parents of young children have been a key audience for a number of years and we connect with them in several different ways. Primarily, we partner with Whānau Āwhina Plunket to deliver our dedicated *Quake Safety for Young Children* publication to parents as part of Plunket's new baby bags. More than 25,000 copies have been distributed since we first partnered with Plunket in 2021, with a focus on higher risk seismic areas of the motu. 2023 saw *Quake Safety for Young Children* translated into 10 languages in addition to English. We have recently confirmed a partnership extension with Plunket that will see activity continue across the next year.

We also deliver advertising material to connect with new parents and 2023 saw the development of new creative content. The adverts feature a to-do list, as if written by a child, of quick and easy steps that will help make their room safer for a quake. This campaign was delivered in press and digitally.



ADVERT FOR NEW PARENTS ON HOW TO KEEP CHILDREN'S ROOMS QUAKE SAFE



QUAKE SAFETY FOR YOUNG CHILDREN BROCHURES HAVE BEEN TRANSLATED INTO 10 LANGUAGES

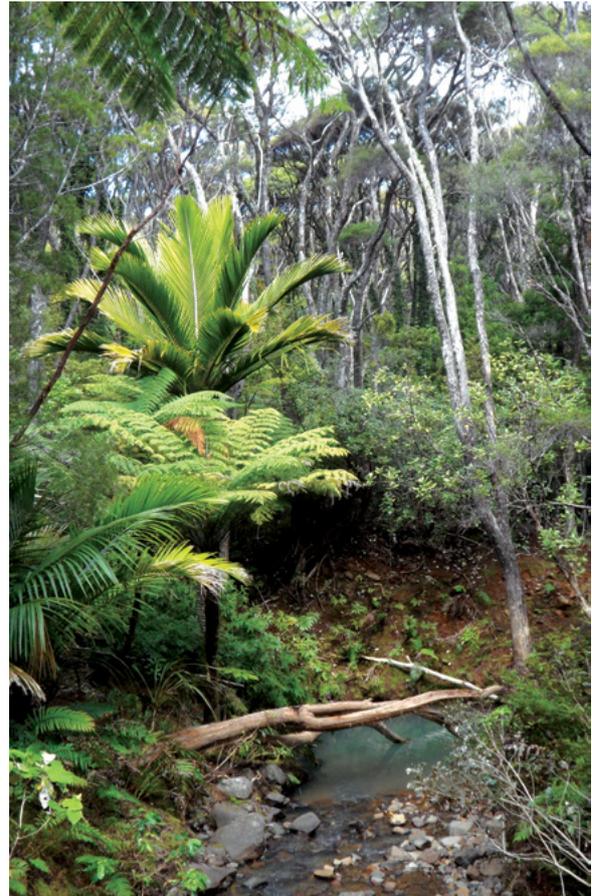


## Shyra Alladeen, Team Coordinator

Shyra's  
administrative skills  
keep the Resilience

and Research's team operations  
running smoothly. She has a Master  
of Laws from the University of Central  
Lancashire and a background in  
teaching.

She has a deep interest in supporting  
New Zealand's people and  
communities become more resilient to  
natural hazards. One of her highlights  
every year is supporting ShakeOut, the  
EQC-funded national event that helps  
New Zealanders be better prepared for  
earthquakes and tsunamis.



MULBERRY GROVE SCHOOL IN GREAT BARRIER ISLAND PARTICIPATING IN SHAKEOUT 2023

## AF8 Roadshow raises Alpine Fault awareness with 3000 people in Te Waipounamu

Latest research partially funded by EQC indicates that there is a 75% probability of a magnitude 8 or greater earthquake occurring on the Alpine Fault in the next 50 years. Such an event has the potential to result in disasters of a scale and impact not seen before in New Zealand.

Local education programme Alpine Fault magnitude 8 (AF8) ran the third iteration of its public roadshow in 2023.

The roadshow sees leading scientists and emergency managers meet with people of all ages to share how their community might be affected by an Alpine Fault event and what they can do to be better prepared.

The 2023 AF8 roadshow connected with more communities than ever, through events that included 24 public talks, 13 school visits and two talks at marae. At many venues it was standing room only.

The roadshow received positive feedback from those attending, including for being accessible and relevant. All up more than 3,000 people were connecting with vital information on the Alpine Fault hazard and risk reduction actions.



2023'S AF8 ROADSHOW CONNECTED WITH MORE COMMUNITIES THAN EVER



## Josh Smith, Advisor Risk Reduction and Resilience

Josh studied Geology and Geography at the University of Canterbury. He joined EQC after completing a Master of Disaster Risk and Resilience in 2023, following an interest in tsunami risk management and understanding science-policy research engagement. Josh has a passion for increasing societal resilience to natural hazards in New Zealand, particularly the resilience of New Zealand's coastal communities to tsunami hazard risk.

## An electric new way to deliver natural hazard education

Our partnership with Tāmaki Paenga Hira Auckland War Memorial Museum resulted in a unique piece of new kit: a Volcano e-Van.

The vivid, electric-powered van allows the Museum to take their 'Volcanoes: The Floor is Lava' programme direct into classrooms across Auckland.

In this free interactive experience, tamariki can connect with their local volcanoes, explore different types of eruptions, and be tested on their preparedness. The goal of the programme is to educate young learners about the fascinating world of volcanoes, and to help them better understand the science behind these natural wonders.



THE VOLCANO VAN DELIVERS NATURAL HAZARD EDUCATION TO THE CLASSROOM

“

With the support of EQC, we are thrilled to be able to take this unique education programme direct to local schools and ensure that the next generation can understand the landscape they live in – and how to be prepared in the case of an eruption.

**Auckland Museum Chief Executive David Gaimster**



AUCKLAND MUSEUM'S EDUCATION TEAM BRINGING THE 'VOLCANOES: THE FLOOR IS LAVA' PROGRAMME TO SCHOOLS AROUND THE REGION

## Engaging Pacific communities to learn more about local hazards

Too often, we realise after a disaster that communities have not had access to, or have not engaged with, disaster and emergency messaging, and as a result they are not adequately prepared.

NIUPATCH (Navigate In Unity Pacific Approaches to Community-Humanitarianism) is a practice-informed research collective with the aim of taking relevant research, particularly around disaster preparedness and response, and making it accessible to Pacific communities.

Thanks to EQC funding, the NIUPATCH team worked with two South Auckland schools to ask students how they would communicate preparedness messaging to their households. Nearly 300 predominantly Māori and Pacific staff and students from Roscommon and Waimahia schools in Manurewa, Auckland were involved with the project. The programme visited each class two to three times, engaging with the students to understand their knowledge of emergency preparedness, local hazards and fill in the gaps. The students were then able to brainstorm ideas for disaster messaging tools.

The bulk of our funding was used to purchase equipment and resources for the schools to create and disseminate this messaging. Most students chose video-based communication and were able to create videos to be shared with their families and via their school's private social media channels. Our *Quake Safe Your Home* brochures and *Kids' Activity Sheets* were also supplied to children and their families.

NIUPATCH says there was a high level of engagement from both staff and students and, as a result, both schools are seeking further involvement. They plan to use the videos for continuous engagement within their school communities, supporting ongoing learning about disaster risk reduction and the creation of further content, all with the aim of increasing resilience for future disasters.

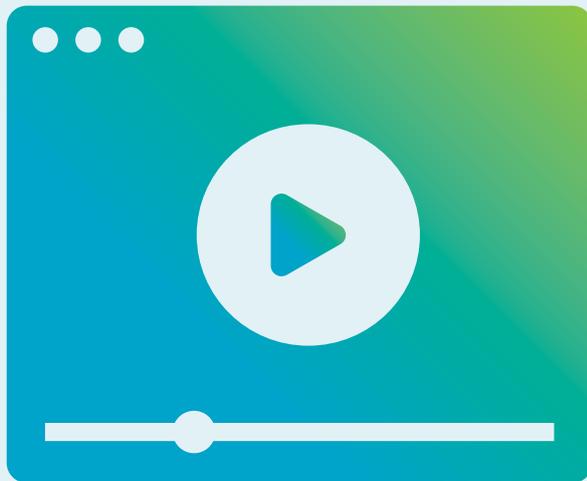


THE NUIPATCH TEAM ASKED STUDENTS FROM SOUTH AUCKLAND HOW THEY WOULD COMMUNICATE PREPAREDNESS MESSAGING TO THEIR HOUSEHOLDS

## EQC 2023 CAMPAIGNS BY THE NUMBERS

2,416,139

full plays of EQC video content



100,090

visits to the Be Prepared  
section of the EQC website



34,089,849

impressions of EQC messages  
delivered to New Zealanders



- ▶ Water Supplies
- ▶ Energy
  - ▶ Back-up Electricity – generators
  - ▶ Fuel for vehicles and other machinery
- ▶ Point-end Loaders
- ▶ Isolated communities – could you last 2-3 weeks without any supply?
- ▶ Supply Chains – how resilient are your roads and bridges?
- ▶ Compounding impacts
- ▶ What if this event happened in the middle of a drought?

**ALPINE FAULT EARTHQUAKES**

**MAGNITUDE INTENSITY**

EQC-FUNDED AF8 ROADSHOW



# LOOKING AHEAD

We are increasingly relied on for our expertise in generating, translating and applying natural hazard risks data and information.

In 2024, we'll review ways to grow the Natural Hazards Portal and work with councils to implement risk data and loss modelling information in their land-use planning. We'll also continue to roll out our risk tolerance framework, by offering workshops for councils and other interested stakeholders.

At a national level, we'll keep working closely with government agencies to enhance policies and practices towards improved hazard risk management. One area of focus is filling critical gaps in New Zealand's building management. We're learning more about what New Zealanders expect from resilient buildings and applying this knowledge through publishing guidance and support documents, as well as establishing a national building dataset.

When it comes to sharing information directly with communities, we're redoubling the focus of our public education strategy on inspiring risk reduction action, raising awareness of hazards and engaging New Zealanders with natural hazard insurance cover, while better linking with our Te Ao Māori Strategy.

To check how it's working, we're introducing new measures of success which will help us better identify and address gaps in New Zealanders' uptake of risk reduction actions.

Much of our risk reduction and public education work is informed by research we and others fund. We're working on a better pathway to practice, ensuring the latest research is incorporated into our public education programme and delivered to communities in fresh and engaging ways.

There will be lots of new knowledge to share because, in 2024, we are supporting 27 new research projects or programmes – a record number.

We're developing a research strategy for the long-term success of all our funded research beyond financial investment, working closely with researchers to ensure the output of their work is well communicated, understood, and used by public, in policy and practice. To measure the impact of the research we fund, we're also setting up a benefits management framework, ensuring our investment in research delivers lasting benefit for New Zealanders.

# NEW RESEARCH PROJECTS STARTING IN 2024

*Slope hazard hotspots in Aotearoa's changing climate*, Dr Katherine Yates, University of Canterbury

*A national landslide risk assessment for residential housing*, Dr Tom Robinson  
University of Canterbury

*A history of fault activity in the vicinity of Aotearoa's supervolcano*, James Muirhead,  
University of Auckland

*Comparative Analysis of Lifetime Costs Base Isolated Buildings vs. Conventional Buildings*,  
Dr Alex Shegay, University of Auckland

*Cascading coastal inundation losses on Māori assets in the southern Marlborough district*,  
Dr Shaun Williams, NIWA

*Geological Modelling the Hamilton Basin to Improve Earthquake Ground Motion Simulation*,  
Dr Andrew La Croix, University of Waikato

*Quantifying corrosion to improve Aotearoa's built environment resilience to future volcanic eruptions*, Associate Prof Carol Stewart,  
Massey University

*High spatial resolution simulation platform for integrating land use, economics, and infrastructure*,  
Dr Robert Cardwell, Market Economics Ltd

*Dynamic Volcanic Ash Damage Forecasting for Aotearoa-New Zealand*,  
Dr Josh Hayes, GNS Science

*Virtually flooded: Improved risk communication through immersive virtual reality*,  
Prof Matthew Wilson, University of Canterbury

*Quantifying the expected seismic performance of 3-storey timber framed housing*,  
Prof Tim Sullivan, University of Canterbury

*Managed Retreat, Private Insurance Retreat, Public Insurance and the Connections Between Them*,  
Prof Ilan Noy, Research Trust of Victoria University of Wellington

*Understand the risk tolerance of hapu and iwi to natural hazards*,  
Prof Regan Potangaroa, Massey University

*Advancing national and community-based public education for impactful change*,  
Associate Prof Julia Becker, Massey University

*Robust and low-damage structural design for housing*,  
Associate Prof Richard Henry, University of Auckland

*Engineering for stronger homes and better land in New Zealand*,  
Associate Prof Liam Wotherspoon, University of Auckland

*Resilience to Earthquake and Landslide Multi-Hazards*,  
Dr Timothy Stahl, University of Canterbury

*Next-generation seismic hazard analysis for NZ*,  
Prof Brendon Bradley, University of Canterbury

*Assessment and Mitigation of Liquefaction Hazards*,  
Prof Misko Cubrinovski, University of Canterbury

*Toka Tu Ake EQC Research Programme  
in Earthquake Seismology and Tectonic  
Geodesy, Prof John Townend, Research Trust  
of Victoria University of Wellington*

*How misleading are past experiences when  
planning for future record-shattering rainfall  
extremes, Dr Luke J. Harrington, University  
of Waikato*

*Developing an agent-based land-use  
modelling approach to understand future  
multi-hazard urban risk profiles, Prof Iain  
White, University of Waikato*

*Geophysical imaging of the Paeroa Fault for  
improved earthquake modelling, Dr Brook  
Keats, GNS Science*

*Lava flow impacts on buildings and  
infrastructure taking lessons from La  
Palma to New Zealand, Dr Geoff Kilgour,  
GNS Science*

*InSAR monitoring of slopes to build back  
safer, Associate Prof Martin Brook, University  
of Auckland*

*Insurance settlement following the 2016  
Kaikōura Hurunui earthquake: a comparison  
of rural, town and city claimant experiences  
and behaviours, Cameron Eade, Resilient  
Organisations Ltd*

*Slope Stability Guidance Series – Phase 2,  
Units 2 and 3, Richard Justice, New Zealand  
Geotechnical Society (NZGS)*





**Our vision is that  
natural hazards  
resilience  
becomes  
embedded in  
all aspects of  
decision-making  
for our homes,  
towns and cities.**

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**🌐** eqc.govt.nz

**Te Kāwanatanga  
o Aotearoa**  
New Zealand Government

**EQC** Toka  
Tū Ake