



NATURAL HAZARDS AND RESILIENCE PLATFORM

Enhancing New Zealand's resilience to natural hazards

Platform Plan

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SECTION ONE:

Contact Information

1.1 Primary Contact

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SECTION TWO:

Summary Information

2.1 Executive Summary

The Natural Hazards and Resilience Platform (the Resilience Platform) is an innovative research alliance partnering with practitioners to enhance New Zealand's resilience to natural hazards. The Resilience Platform will build on the successful legacy of the Resilience National Science Challenge to maintain and extend relevant science capability, conduct an integrated programme of impactful research spanning disciplinary boundaries, and nurture new science leadership.

The Resilience Platform will deepen existing partnerships and foster new connections with research users to ensure alignment to the resilience mission and enable uptake of science into practical action. The Resilience Platform will mobilise existing data and knowledge for fresh insights, as well as driving innovation for new knowledge and know-how. The approach will balance immediate with longer-term needs when considering research priorities and allocating resources. The science will be clustered in five key areas, including three core science themes:

- Living with Risk
- Better Resilience Decisions
- Next Generation Risk Assessment

and two interweaving themes;

- Vision Mātauranga, and
- Data and Enabling Technologies

The scale and complexity of the natural hazards resilience mission requires ambition beyond the capacity of the Resilience Platform alone. In support of the Platform science programmes, functional capabilities will drive engagement and communication of science activities and outputs, and enable connectivity and cooperation across allied research programmes to maximise system-wide opportunities and impacts.

A specific Resilience Platform function for post-event science coordination will facilitate the capture of relevant perishable data following damaging natural hazard events by multi-agency teams, to analyse event characteristics, and inform recovery and adaptation for future events.

2.2 Public Statement

Damaging and disruptive natural hazard events are a feature of New Zealand's dynamic environment. The same processes that generate our dramatic, picturesque landscapes and natural resources intermittently cause widespread devastation and disruption to New Zealanders' lives, livelihoods and communities. Earthquakes, storms, and volcanic eruptions are inevitable. But we can avoid these events turning into disasters by reducing our risks at the government, council, community and household levels.

To do this, we need to work together in new ways.

The Natural Hazards and Resilience Platform (the Resilience Platform) is a new multi-institutional, collaborative research programme with a mission to accelerate our resilience to natural hazards. Building on the efforts, achievements and ways of working in the Resilience National Science Challenge (2014-2024), the Resilience Platform is mobilising scientists, resources, agencies and communities to collectively innovate to address this difficult challenge.

The Resilience Platform will develop new knowledge about natural processes, better utilise and leverage existing information and insights, and create evidence-based tools and guidance matched to the needs of research users.

Māori researchers will work closely with collaborators in hapū and iwi to advance Māori aspirations for resilience through place-based research. The Platform is developing a new partnership with the Iwi Chairs' Forum to ensure this research is linked to strategic goals at the national level.

By 2032, the Platform's programme will have successfully combined natural hazard datasets, developed advanced models to understand hazard impacts, and improved the way we measure and understand hazard risks under different scenarios. These insights will be linked with new approaches to studying the social, economic, and governance aspects of disaster risk and resilience, using new data science and technologies to help make more informed decisions across different sectors about reducing risks and building resilience.

The breadth and depth of the Platform's capability across hazard science, social science, engineering and emergency management, combined with strong internal and external networks, make it well-placed to coordinate science responses following large natural hazard events. This new function will ensure that post-event research activities are aligned, the needs of response agencies and communities are met, and that lessons are captured to drive future resilience.

Through scientists, agencies, councils, iwi, industry and communities working together in partnership to build our resilience, we can envisage a future in which we understand our dynamic environment, and know how to anticipate, adapt and thrive in the face of hazard risks.



Image: Participants at early Platform Engagement workshops. Credit: Dave Allen



SECTION THREE:

Platform Plan

3.1 Strategic intent

Vision

The Resilience Platform drives impactful science and innovative collaborations to accelerate New Zealand's natural hazard resilience.

Strategic Rationale

The Challenge: Natural hazard risks have significant economic and wellbeing consequences

New Zealand is a small economy exposed to the full range of damaging and potentially catastrophic natural hazard risks, threatening lives, infrastructure and economic stability. Impacts to even one community or region can have national consequences. Given that many natural hazards cannot be prevented, and in many cases are exacerbated by a changing climate, New Zealand's households, communities, businesses and government must manage the escalating costs and disruptive effects of increasingly severe and complex natural hazard events.

Recognition of the increasing exposure and future risk by some markets means financial impacts are being felt now, with insurance premiums rising or cover being reduced or removed. This exposure to risk decreases household disposable income, and local economic activity and investment. For marginalised communities, natural hazards are a risk multiplier, compounding long-standing inequities. Insurers are also presenting legal challenges, accusing local governments of negligence in preventing flood disasters which has redirected scarce public funds towards legal costs.

The magnitude of recent losses and their drag on economic prosperity, and the long tail of social impacts of drawn-out disaster recoveries signal an urgent need to reduce our social and economic vulnerability to natural hazards. The increasing complexity and interconnectedness of natural hazard risks demands a step change in how we prepare for, and respond to, natural hazards. Traditional approaches to hazard management, focusing reactively on emergency response and recovery, must evolve into a more proactive, risk-based model that integrates cutting-edge science, policy and economic analysis, decision-making frameworks, and social considerations.

Scope of the Resilience Platform

It is vital that resilience research builds a knowledge base, and connects to decision-makers at all levels, to protect public safety and assets, to inform evidence-driven investment decisions and to ensure long-term economic prosperity.

Research driven through the Natural Hazards and Resilience Platform will equip both policy and private sector practitioners with proven insights into the hidden barriers confounding risk reduction and recovery, tested in real-world contexts, to strengthen end-users' capacities to galvanise action, at scale. Unique partnerships between science, policy and planning will be established, strengthening knowledge exchange and peer-learning to deepen the use and application of research.

On that basis, the Platform will be structured across three main science themes, determined through the process of engagement with users and researchers since the end of October 2024:

1. Living with Risk

This theme places people at the centre of risk reduction and resilience, aiming to drive a shift toward a whole-of-society approach that integrates various sectors and communities to strengthen New Zealand's capacity to plan for, adapt, respond to, and equitably and effectively recover from multiple hazard risks.

2. Better Resilience Decisions

This theme will support decisions made by the institutions, agencies and businesses charged with managing risk for themselves or for others, through robust science-based information, tools and guidance.

3. Next Generation Risk Assessment

This theme will refine understandings of natural hazard processes, develop and test new methodologies for quantifying multiple hazards and risks, and develop consistent and comparable hazard and risk information to support decision-making. This theme strongly underpins the other science themes.

Each theme will be a programme of integrated science, a collection of related research projects and a community of practice. Each will be strongly multi-disciplinary while the mix of physical, social science, engineering, data science, economics, mātauranga māori and other disciplines will reflect the research objectives of each. In practice the boundaries between each of these themes is diffuse, with purposeful and managed overlap allowing for successful integration and progression for flagship-style, cross-cutting, or multi-disciplinary place-based projects.

Additional specialist research capability will connect across the core science themes, including:

Vision Mātauranga

Research and activities interwoven across the core Platform science themes to support the aspirations of Māori for improved disaster resilience, and a community of practice for Māori researchers

Data and Enabling Technologies

A targeted programme to lift capability and bring a greater focus to the innovation potential of data and enabling technologies in service of the resilience outcomes of the central science themes and Vision Mātauranga

In support of the science and research innovation programmes four enabling functions wrap around these to drive system connection and cooperation to maximise impact. These are:

Post-event Science Coordination and Learning from Events

Capturing data and insights, synthesising and applying lessons from damaging natural hazard events

Knowledge Mobilisation

Synthesising, translating and communicating Platform science for impact

Hazard and Resilience Research Alliances

Unifying the research system and lifting the collective effort required to address the resilience mission

Resilience Catalyst Centre

An innovation hub to address emerging user needs through joint research and resilience solutions

The integration of innovative science effort, knowledge and partnerships enabled by the Resilience Platform will transform our understanding of hazards and quantify their range of impacts, the factors that enhance or impede the ability of people, communities, businesses and government to build resilience, reduce risk, respond, and recover from disruption. These and other changes will shape different resilience-focused governance systems, create new demands on decision making, but also provide an opportunity for resilient adaptation.

Research Principles

In making decisions about approach and priorities, the Platform will consider several principles to ensure both excellence and impact are achieved.

- **Partnering for excellence and impact:** Success requires a focus on elevating partnerships and working collaboratively to advance the shared natural hazards resilience mission.
- **Impact pathways must demonstrate robust connection to uptake:** Participation by implementation partners, including in project co-design and delivery, will be key for effective uptake of Platform science.

Figure 1. A conceptual diagram showing the research areas and other capability and functions of the Resilience Platform
Credit: Alice Lake-Hammond

- **Evolving research priorities accommodated over time:** Research funding decisions will consider the long-term focus necessary for maintaining strategic science capabilities, balanced with the flexibility to respond to emerging needs.
- **Multi-hazard, multi-disciplinary approach across the four Rs:** The Platform will consider its research profile across risk reduction, readiness, response and recovery, in conjunction with adaptation, as well as the relationships between these concepts, across multiple natural hazards and relevant scientific disciplines.
- **A range of research horizons:** The Platform will actively manage a balanced research portfolio covering the continuum from to 'stretch' (new ideas) to highly-applied science (proven ideas), and facilitate progression of research efforts from new ideas to application.
- **Strategic leadership:** Platform science leaders will be highly-regarded individuals with a strategic view of resilience, who can work effectively across science disciplines and with partners to create opportunities and deliver impact.
- **Research focus across spatial scales:** The Platform will fund research that addresses resilience across scales—from local to national—based on where it makes most sense for accelerating resilience.
- **Research focus across time scales:** The Platform will seek to fund research that addresses resilience across timeframes, extending lessons from the past, to present-day planning, through to modelled future scenarios to account for climatic, demographic, and broader social change.
- **Open research / data:** Data and tools developed within the Platform will be published and disseminated under New Zealand Government Open Access and Licensing (NZGOAL) principles. There will be open sharing of data, samples and results between all our collaborators and end-users.

3.2 Impact

Delivering Outcomes and Impact

Delivering societal value is a key focus of the contemporary research landscape and advancing the complex resilience mission of the Platform requires knowledge and insights be implemented in practice. For science to be implemented it must be relevant to the needs of users and policy- or practice-ready.

To ensure relevance and utility, the establishment of the Resilience Platform started with wide engagement across a range of resilience policy-makers, practitioners and implementation partners to co-design an outcomes framework that identifies long-term impacts and medium- and short-term outcomes at the whole-of-system level, with research needs aligned to those strategic outcomes. The scale and complexity of the resilience mission results in a system-level outcomes framework (Fig 2) that is comprehensive and has been acknowledged as serving the wider resilience sector, not just the science domain.

Navigating from system-level impacts to science activities reveals the broad thematic scale and interconnectivity of the science required to achieve the Platform outcomes. Specific implementation pathways for generating impact across the science themes are described below.

Partnering for Impact

The Platform builds on the achievements generated by the Resilience NSC and seeks to create a step change in economic, social and environmental resilience. This includes further evolving from a 'knowledge deficit' theory of change (that filling science gaps alone instigates action) to a more strategic and proactive approach that considers context and capability, and the need to elevate collaboration and facilitate partnerships and resourcing at the project level.

Effective impact strategies require a mix of top-down approaches to foster an organisational environment where impact is resourced and supported, combined with project-level planning where impact is considered in research design and typically involving tailored partnerships with users. The three aspects below summarise how the Platform will engage with and advance existing best practice, and demonstrate the value of the Platform to external audiences.

Impact Culture and Capacity

Building on the successful Resilience NSC approach, to further evolve impact culture, the Platform will be similarly positioned as a boundary organisation cutting across institutions and scientific disciplines, and spanning science and policy, practice, business, and mana whenua and community activity. This will allow for a 'co-creation lab' approach, proven in the Resilience NSC, that will facilitate impact through mutually-agreed objectives, knowledge exchange and joint action, and ensure accountability to multiple partners.

Building on existing relationships and the high level of trust already developed, this structure is designed to enhance the usability of research in resilience decision-making, and enable the application of innovations and know-how. We will build trust and sustained relationships with end users, to inform the design of our research, the design of our outputs, and the pathway to wide adoption of research outputs. These deep relationships will enhance the sense of ownership amongst end users, improving uptake in end products. Where possible we will leverage effective existing structures, such as AF8, and explore support for reinvigorating other sector initiatives (such as East Coast LAB). We are actively building new connections with partners such as with the National Iwi Chairs' Forum, specifically Te Pou Take Āhurangi which is responsible for representing 88 iwi interests in climate resilience.

Mission: Aotearoa New Zealand's Resilience to Natural Hazards is Enhanced

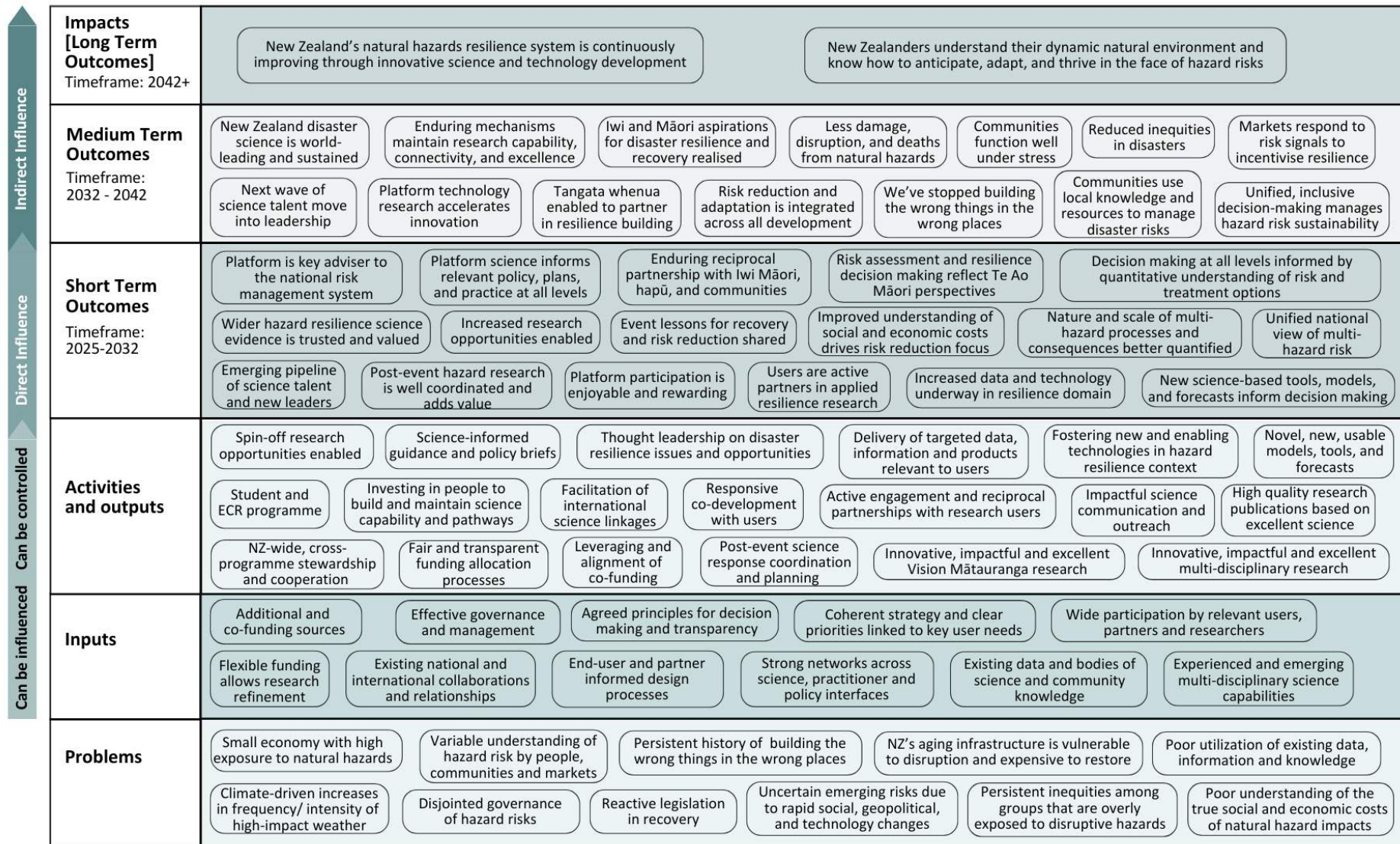


Figure 2. Resilience Platform Outcomes Framework

We will appoint specialised Knowledge Brokers to facilitate impact in the science themes and drive integration and action through our Knowledge Mobilisation and Resilience Catalyst Centre functions. These dedicated roles will operate as intermediaries, supporting a community of practice, and identifying opportunities for translating and synthesising knowledge into outputs and activities for users. These roles will drive engagement within and beyond the Resilience Platform, support science communication, and assist researchers to build connections and influence policy and practice. A specialised Vision Mātauranga Knowledge Broker will provide strategic direction and frameworks for engaging with Māori community partners on research that is relevant to their needs.

Impact Literacy and closing the ‘Impact Gap’

Impact culture and capability will be enhanced by pursuing a strategy of increasing ‘impact literacy’ across the Platform, involving training, support and capability building, and drawing from best practice identified by impact-focused practitioners and academics. This initiative responds to a body of research that suggests many researchers want to influence policy and practice but think they don’t have the skills and knowledge to deliver impact. We will focus on early-career researchers to improve long-term capability and skills, fostering their ability to engage with diverse networks and create meaningful impacts in interconnected domains. This approach also recognises the existence of an ‘impact gap’ where for an impact agenda to be equitable, students and early-career researchers need to be supported and mentored to gain the kinds of networking skills, profile, connections and relationships that senior colleagues have fostered through their careers.

Impact Focus, Research Design and Project Pathways

Platform Knowledge Brokers will also focus on targeted pathways to impact, including developing specific capacity in translating and linking science to users, such as targeted policy briefs in response to policy cycles.

We will also develop a scalable and targeted approach to focus our resources efficiently. For example, end-to-end projects, and those with a clear, direct relationship to application, will be expected to embed impact in project design as well as implementation, but more fundamental projects delivering mostly to next users will have a lesser focus on impact.

Relevant projects and programmes will determine a targeted pathway to impact that integrates with the Platform outcomes framework. This intervention logic, linking research activities, outcomes, partners, and impacts, will move beyond traditional academic success metrics and help break down the nebulous concept of impact to capture a broader range of potential benefits, identify key audiences, and allow for comparability and measurement despite methodological or disciplinary diversity.

The Platform will also develop impact case studies that will disseminate best practice in approaches and demonstrate to external audiences how our research has changed practice. Additional resource will support the collection of data from users after the project has finished, to inform relevant key performance measures. This will involve interviewing users to ascertain the extent to which science changed practice as outlined in the initial proposal. This qualitative approach is a response to the five well-established challenges in measuring impact by metrics: Time lag, timing (when it occurs), attribution, knowledge creep (e.g. public discourse may first influence policy change), and gathering evidence.

Post-event Science Coordination and Learning from Events

The Resilience Platform has been tasked with establishing a function to deliver post-event coordination of science activities following significant natural hazard events. This function will formalise an ad-hoc and unmandated role played by the Resilience NSC (and Natural Hazards Research Platform before it) during events such as the 2010-2011 Canterbury Earthquakes, the 2016 Hurunui-Kaikōura earthquake, the 2023 Auckland Anniversary floods and Cyclone Gabrielle, and several other local storm events.

These events have all shown the essential role of science to support community and agency understanding of what has happened and why, and the value of new insights when applied to future planning. The function will enable coordinated activity involving relevant Platform science capability, so that perishable data can be collected and analysed, and lessons and insights gathered to inform event recovery for the affected community, as well as risk reduction and resilience for future events.

Strong stakeholder input during the Platform establishment identified a need for a more integrated approach to capturing and applying lessons and better utilisation of existing information and knowledge to drive changes across all dimensions of disaster resilience. Consequently, this function will be broader than post-event coordination and will provide a capability home for improved application of what is already understood as well as integrating with new knowledge derived through post-event science responses.

Work is underway to determine the scope and define the set of operating principles and roles and responsibilities for post-event science coordination. It is expected that the function will be formally implemented through the later part of 2025 and once operating will include on-going scenario planning and capability-building activities (leveraging joint activities such as national exercises), to enable effective surge-response following relevant events. Contracted research in the Platform will be expected to re-prioritise effort for events for which no additional resources are provided by government. Prior to full contracting across our science themes, a contingency fund will be used to engage relevant science capability in case of a significant event requiring a science response. The review of the science response to the 2023 North Island Severe Weather Events (commissioned by the Resilience NSC) will inform the scope and functions of the Platform's post-event science coordination.

Knowledge Mobilisation to maximise impact

This cross-cutting function and capability area will drive knowledge mobilisation across the Platform to maximise impact. This function is closely linked to the impact pathways outlined above. It will serve as a community of practice, involving communications and engagement staff in the Platform leadership and management teams, Knowledge Brokers, communications and engagement leads in science programmes (who could be practitioners, researchers, students, or community specialists), hazard and risk communication researchers, and researchers who are interested in developing their skills in this area, or mentoring others.

This function will enable close linkages between researchers and practitioners to ensure a) new knowledge about best-practice hazard and risk communications is adopted in Platform practice, b) coordination of user-focused outputs and activities, and c) opportunities for researchers to upskill in engagement, science communication and creating impact.

The Knowledge Mobilisation strand will also have close linkages (and overlapping membership) with the Data and Enabling Technologies programme, the Resilience Catalyst Centre, and Vision Mātauranga. Through relationships built during the Resilience NSC, staff will also work closely with communications and engagement practitioners in aligned natural hazard programmes, via the Plate Boundary Network (and supported through the Platform's Hazard and Resilience Research Alliance function). This will enable collaborative planning of outputs and activities to reduce stakeholder engagement fatigue.

Hazard and Resilience Research Alliances to maximise impact and build capability

The scope and complexity of the resilience mission requires science and capability beyond the funded boundaries of the Platform. Platform success will therefore necessitate connectivity and cooperation among all relevant New Zealand hazard and resilience research programmes and researchers, as well as with research users. Engagement during establishment identified a strong interest from other research programmes for the Platform to take a facilitation role across the hazard and resilience research domain. Through the proposed Hazard and Resilience Research Alliances (HRRAs) function the Platform will actively

connect relevant science activities aligned to the common resilience mission to:

- maximise opportunities for sustained funding through cooperation to create new opportunities,
- collectively build a strategic view of future hazard and resilience science capability needs, and
- work together to simplify user engagement across the multitude of active hazard and resilience projects.

As part of the design of the Platform science themes, the early focus of this enabling function will be to identify shared opportunities to co-fund research activities (such as jointly funding PhD students with QuakeCoRE and various Endeavour programmes, and aligned with CRI SSIF), to avoid duplication and maximise leverage and capability.

Building on the effective coordination role played by some Resilience NSC programmes, the Platform HRRRA function will host coordination mechanisms addressing specific science issues (for example for national hazard and risk model development, and for data access and utilisation), and networking for situational awareness across different programmes working in the same location or addressing similar problems (e.g. volcanic risk) or working with the same stakeholders. Utilising the system view of funding (Fig 3), we will monitor aligned funding and project progress and connect this with emerging users' needs to steward a joined-up approach to securing new funding opportunities that build science capability across the system.

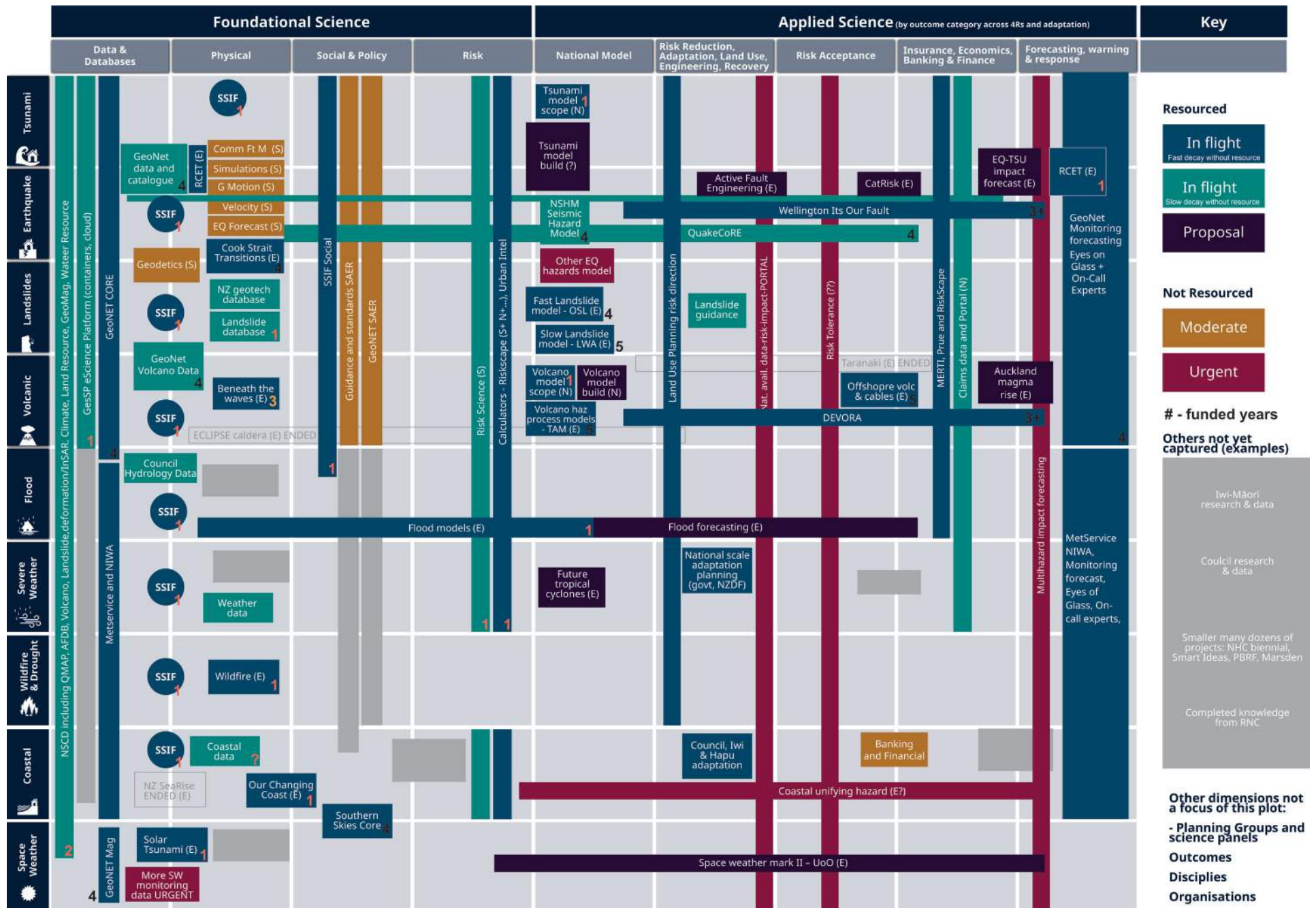


Figure 3. Hazard, risk and resilience research programmes, shown by hazard type and value chain elements.

3.3 Science Excellence

Excellence by Design

Our approach to programme design, research team selection and leadership appointment aims to ensure scientific excellence underpins all aspects of the Platform. Research questions within our main themes (summarised in section 4¹) have been determined through wide and expert engagement to ensure both local applicability and international relevance. Building on the acknowledged science excellence of the Resilience NSC, we are assembling teams of highly credible New Zealand scientists that are well connected domestically and internationally across the broad set of disciplines relevant to addressing disaster resilience. Our research will be led by experts with established domestic and international reputations in hazard processes, hazard and risk model development and assessment, disaster economics and risk financing, planning and governance, risk management, engineering and asset management, indigenous knowledge, human behaviour and psychology, risk communication, and data science and enabling technologies.

Excellence through the life and evolution of the programme will be assured through the combination of peer-review by the international science community of published and presented Platform research, as well as the relevance and quality of journals and citations. Additionally, we will establish a multi-disciplinary International Science Panel (ISP) to evaluate the quality and international relevance of Platform multi-disciplinary science as well as to advise, when required, on any necessary changes in research direction or focus, including emerging and new research capability needs. We expect to stand-up the ISP by August 2025 to provide independent evaluation of the science quality of the science theme programmes, and will utilise the panel for future contestable processes and evaluation of research direction.

Positioning in the research landscape

The Resilience Platform builds on the positioning established through the Resilience NSC with research and researchers connected across extensive local and international networks and programmes of aligned activity. As with the Resilience NSC, the Platform research activities will be closely networked other with relevant national hazard resilience research programmes (section 4), with close coordination enabled through the proposed Hazard and Resilience Research Alliances coordination function (section 3.2) to ensure cooperative effort, and coordination of engagement to ease system navigation for stakeholders and partners.

Building on the successful model under the Resilience NSC, many Platform leaders and scientists will have leadership roles in other national programmes and participate in international initiatives such as Horizons Europe and Natural Hazards Research Australia, and have their own extensive peer-peer connections around the world (section 4.2). These well-networked leaders provide important nodes in the domestic and international context, ensuring key parts of the system are naturally well-connected and can be innovative and flexible. We will use the in-built system of situational awareness to limit unnecessary duplication of effort and identify opportunities. This will assist prioritisation of new Platform investments and ensure Platform science is of the highest science excellence as well as strategic value for the resilience mission, and supporting stability of important science capability.

Indigenous Knowledge and Innovation

Excellence in indigenous knowledge, science and innovation is essential to delivering on the resilience mission. The aim is to draw on existing indigenous networks and knowledges to build relationships and connection and to inform our science. We know that indigenous communities globally are grappling with climate change, adaptation, natural hazards and risk and have proven that indigenous knowledge and approaches have built sustainable solutions that contribute to a resilient future.

Māori capability and communities are at the forefront of effective community responses to damaging natural hazard events, and undertaking proactive and innovative planning to increase resilience to natural hazards. Our Vision Mātauranga programme will support relevant capability for exploring the innovative

potential by Māori researchers and scientists alongside hapū and iwi partners to develop and apply knowledge, elevating mātauranga and tikanga-led decision-making while identifying solutions that address whole-of-community resilience.

The Platform will build on the capability and network of Māori researchers and iwi and hapū partners established through the Resilience NSC, and develop new connections such as with Te Pou Take Āhuarangi within the National Iwi Chairs' Forum. Through existing relationships and this new partnership, Māori scientists and researchers will work with indigenous knowledge, frameworks and networks to collectively address critical science solutions required to enhance community resilience.

Novel Approaches

Development of novel approaches has been identified through the design phase as essential for advancing the resilience mission and extending capabilities to address emerging needs and opportunities. In response to this, the Platform will establish a new cross-cutting Data and Enabling Technologies capability and research programme, and a Resilience Catalyst Centre. These are described in more detail elsewhere in the Plan (section 4). Novelty will be a feature of elements of Platform science across all themes and areas of the Platform, including the approach to partnering to maximise impact (via boundary-spanning), in enabling New Zealand-wide collaboration and international connections, project design and start-up, and mechanisms for supporting capability.

Science Communication

Identified best practice in mission-led science communication will be at the heart of the Platform approach to communicating research. Science communication will be planned as part of project design, with support from science communication experts in the Platform directorate and Platform Knowledge Brokers. Cross-theme science communication opportunities will be coordinated through the Knowledge Mobilisation

Major science questions

The science questions for the Platform are diverse and multi-faceted, reflecting the broad and multi-disciplinary nature of the science essential to addressing natural hazards resilience. Representative science and research questions are summarised in section 4 and for Vision Mātauranga.

These questions were determined through the phased engagement to establish strategic goals and research needs, and refined by the Design Team through synthesis of the wealth of workshop inputs. Further refinement and iteration will occur through the next phase of detailed programme design for each research theme, and will be evaluated by the International Science Panel.

3.4 Team Excellence

The Platform will build on the acknowledged expertise and excellence of Resilience NSC researchers to provide for continuity, while also seeking to extend involvement of new skills and expertise where gaps are identified. In determining the strategic needs and research direction of the Resilience Platform the design process has connected beyond the network of Resilience NSC researchers and practitioners and engaged a wider group of science capability relevant to an evolving future programme. An open invitation to New Zealand researchers was made through key institutions and networks, with over 280 researchers (and over 360 people in total) attending a series of workshops and wānanga in late 2024 and early 2025. Additionally, an open call for Platform Plan design team members was made in early 2025 including reaching out to implementation partner organisations to contribute relevant skills, expertise and perspectives.

Team formation based around the Platform science themes and VM programme is at an early stage but is expected to firm-up quickly through the detailed programme-design during May–July 2025. Based on our experience in the Resilience NSC, we have confidence that essential capability aligned to the research direction is largely known and engaged, with opportunities to diversify and extend capabilities in specialist research areas, such as for Data and Enabling Technologies. Additionally, the capability-retention funding

has ensured continuity of some elements, including supporting emerging leaders relevant to the Platform themes.

Following Plan submission, we expect to initiate a rapid EOI process to identify relevant science leaders for the three science themes, Vision Mātauranga, and Data and Enabling Technologies. These leaders will be responsible for assembling teams and building the multi-year programmes that deliver on the strategic intent and research priorities of these focus areas, as well as on-going system-wide science leadership. These leaders will be highly credible New Zealand scientists and other knowledge holders selected for their ability to take a strategic system-wide view, their domestic and international reputations in their disciplines, their ability to work collaboratively to ensure programme goals are met, and their effective partnering with users to deliver impact. Collectively these leaders will also be responsible for development of science capability through the life of the programme and addressing shifts in priorities in response to emerging needs, as well as the integration needed across the themes to deliver on the resilience outcomes.

Transparency

Transparency on leadership and team selection in programmes and projects will build on the approach to developing the 'right teams' in the Resilience NSC, with agreed and publicised criteria for leadership and team selection, including expectations for behaviours that foster collaboration, the ability to work effectively with stakeholders and partners, as well as a robust evaluation process.

Enabling new entrants

To extend relevant collaborations, build capability and stimulate new thinking, we will provide ongoing opportunities for new entrants to participate in the Platform through periodic competitive or targeted funding rounds aligned to the mission and the science and capability themes. Additionally, we will leverage existing international peer-to-peer and institutional connections (such as with Natural Hazards Research Australia) to build an international network of purpose-driven resilience research.

Managing scope

The identified research themes have been defined in part to provide the necessary focus to ensure the science investment is not spread too thinly. Another design element is the role that project selection in negotiated programmes (and targeted funding) will carefully consider not only the value for strategic impact and science excellence, but also the role the activity may have for continuity and building science capability. As part of on-going activities in the proposed Hazard and Resilience Research Alliances function, the Platform will play a facilitation role and work with other institutions to consider what the national science capability requirements are for the future.

Project management

Project management will draw on the successful approach developed through the Resilience NSC and involve close collaboration between dedicated centralised support and oversight (the Platform directorate) and the devolved project management undertaken by the research themes. Project management/coordination by lead science partners will be stipulated as part of project design, and resourcing will be incorporated in theme budgets and associated contracts.

3.5 Investing in People

The Resilience Platform exists in a wider 'eco-system' of hazard and resilience science capability that sits in multiple, diverse disciplines and across many institutions, both public and private. The challenge for the Platform, as a virtual organisation with limited resources and reach, is determining the role it can most usefully play in supporting capability building in a fragmented, reactive and uncoordinated system in the throes of change. The Resilience Platform will develop capability in the New Zealand hazard and resilience science community through a focus on science capabilities aligned to the mission priorities of the Platform, working with participating institutions, iwi and other partners to advocate for relevant capabilities to be nurtured and enduring.

Overall, the Platform approach within the strategic focus areas is for researchers to be resourced to be active participants and contribute to Platform science development and innovation, as well as associated impact activities, and be enabled to explore a range of development opportunities in collaboration, engagement and communication.

The Platform will leverage its Hazard and Resilience Research Alliance function to work with existing funded programmes and those bidding into other mechanisms (such as the Endeavour Fund) to identify areas of science capability enabled through other means, ensure visibility of emerging needs, and avoid duplication.

Building on the Resilience NSC

Each of the newly defined Platform research themes, including Vision Mātauranga, will draw on a large pool of existing science capability, much of it grown through the first and second phases of the Resilience NSC. Science capability includes peril-specific hazard physical science, hazard and risk modelling, kaupapa Māori research, engineering, and social science including planning, adaptation, risk communication and economics. Some areas of capability identified at risk in 2024 following the end of NSC funding have been supported through short-term projects that are underway and include emerging capabilities in computer simulation for earthquake and tsunami hazard modelling, Māori partnerships, volcanic hazard process and impacts forecasting, coastal hazards assessment and adaptation planning, and community-based risk assessment and preparedness.

Capability Development and Pathways

Capabilities will be developed and supported through investment in strategically-aligned science projects under our priority research themes, as well as targeted and cross-cutting projects. A balanced approach will be taken to support capability requirements for mid- and early-career scientists, and the involvement of postgraduate researchers and post-doctorates. This approach will also consider opportunities for development pathways for scientists, building on the success under the Resilience NSC of Masters, PhD and post-doctorate researchers advancing into science leadership roles over the life of the programme. Another lesson from the Resilience NSC is the value of wider capability development support for researchers to enable them to develop their skills in engagement, communication, project management, network building and working across disciplinary boundaries. Training and mentoring initiatives in these areas by the Platform will add considerable value for both science excellence and impact goals (section 3.2).

How investments in capability will enable hazards and resilience science to adapt

The Platform will retain a level of unallocated funding to enable flexibility to respond to emerging needs as priorities change through the life of the programme. Contestable and negotiated funding processes will be utilised periodically to enable new entrants to teams, and shifts in research focus when required, with input from the ISP and PSG as appropriate.

How the Platform will build innovation and interdisciplinary capability

The Platform builds on the strong multi-disciplinarity of the Resilience NSC, and the integrative nature of the three science themes and Vision Mātauranga programme will foster further interdisciplinary development. Cross-cutting project design activities through the life of the Platform will embed interdisciplinarity, as well as a range of regular events convened and facilitated by the Platform that focus on working across disciplinary boundaries. Innovation opportunities, drawing on the science theme capabilities, will be strongly driven out of the Data and Enabling Technology programme and through the Resilience Catalyst Centre, described elsewhere in the Plan.

Student and ECR Support Networks

Following on from the successful model developed under the Resilience NSC, the Platform will provide support for a student cohort, such as supporting the Disastrous Doctorates symposium, and will explore support options for allied student activities at universities, such as partnering with the QuakeCoRE student chapters. A range of training and development opportunities will also be explored to support students and ECR in building capability in effective science communication and engagement and Treaty-based

partnership with Māori.

3.6 Domestic and International Collaboration

The Resilience Platform builds on the legacy of New Zealand-wide and international collaboration and connection established initially through the Natural Hazards Research Platform, and then extended and deepened through the Resilience NSC and other aligned programmes. This culture of collaboration fostered over the last 15 years has established enduring cross-institutional and multidisciplinary participation critical for delivering on the disaster resilience mission, and placed New Zealand's natural hazards science efforts at the forefront on a global stage.

The Resilience Platform will provide national leadership and coordination to nurture and grow domestic and international collaboration. As with the Resilience NSC, the Platform will act as a hub for multi-disciplinary effort as well as for integrating the discipline-based efforts external to, but aligned with the Platform mission (utilising the Hazard and Resilience Research Alliances function).

The Resilience Platform will support its researchers to connect with and participate in relevant international research opportunities (such as Horizons Europe), as well as further evolving formal international partnerships and collaboration with equivalent international programmes and institutes (for instance Natural Hazards Research Australia, NHRA). A tri-lateral partnership is well advanced between NHRA, North Carolina State University, and the national emergency management agencies of New Zealand, Australia and the US focused on an international community of practice for hazard adaptation. Discussions are also underway with NHRA, US, UK, and Singapore colleagues on the concept of an international network of mission-driven resilience research centres.

The Platform as a virtual organisation represents the collective capability and expertise of its collaborating science organisations and user partners. Participating science organisations will be expected to provide all necessary support to allow researchers to fully participate and flourish in the Platform. In recognition of the wider development benefits, participating organisations will be expected to actively identify and follow through on opportunities to align funding and capability and fully support their research with associated research infrastructure.

Fostering collaboration and participation

The well-established norms and expectations that have successfully nurtured multi-institutional collaboration in the resilience research community over the last 15 years will be sustained through a focus on strategic engagement with researchers and organisations to ensure constructive relationships at all levels, and an emphasis on openness and transparency in decision making and prioritisation. Funding allocation processes will allow for new entrants through the life of the Platform, and a range of activities (such as an annual researcher meeting, and targeted workshops convened on resilience issues and to scope research opportunities) will enable wide participation even for researchers that might not be directly funded through the Platform. The Hazard and Resilience Research Alliances function will support this wider engagement to build a community of aligned research beyond the funded footprint of the Platform.

As described in other parts of this Plan, from the initial workshops to establish the Platform's strategic outcomes through to the co-production that will be embedded in applied research projects, collaboration with iwi / Māori, stakeholders and users is central to the purpose of the Resilience Platform. This collaboration will be nurtured through a focus on key trusted relationships with individuals and organisations, and broadening the involvement of researchers and practitioners in these networks to ensure sustainability.

Collaboration Risks

Collaboration risks exist for both the science elements, and partnership with users for impact. With researchers, the main risks are loss of trust in the Platform as an effective and enabling collaboration mechanism, and also uncertainty and changes in the New Zealand science system that may erode capability and reduce capacity to undertake resource-intensive purpose-driven science. The risk with user collaboration is disengagement driven by a shift in policy, resourcing, and changing priorities for participation and engagement, and by loss or turnover of key personnel in collaborating agencies. Both these risks will be managed as best as possible through ongoing monitoring and a focus on maintaining relationships of trust across research parties and user partners.

3.7 Horizons and Co-Funding Leverage

Research Horizons

The Platform builds on the successful portfolio approach of the Resilience NSC, with a blend of interrelated and integrated projects spanning research horizons. Each research theme will involve activities across all research horizons, with the balance varying within each. Science stretch (H3) will be a strong component of the Next Generation Risk Assessment and the Data and Enabling Technologies specialist themes, with new methods and analysis feeding into the activities of the two other central science themes. The research horizons for Better Resilience Decisions and Living with Risk themes focus on the enhancement of emerging ideas, and the systemisation and uptake of existing proven ideas. The science in these themes is focused on the cyclical and reinforcing process of understanding user needs, making tools fit-for-purpose, supporting and promoting use of tools, and refining user needs. However, these two themes will also stretch research horizons, for instance, in new ways to integrate resilience into development and infrastructure investment decision making, and in new governance frameworks for integrating risk decisions being made by multiple actors and agencies. This mix also ensures that more innovative tools that are developed during the Platform would have a clearer route to impact.

Delivery against the resilience mission requires integration across the research themes (see section 4) and capability areas to enable progression across research horizons, and facilitation of this will be a focus for oversight and management by the science leadership team of the Platform.

Co-Funding Leverage

The mission of the Platform is beyond the scope of the Platform to deliver on alone and will require coordination, alignment and partnership among researchers and research users. Through the Hazard and Resilience Research Alliances function the Platform will actively work across the research domain to identify shared opportunities to co-fund or align research investment (such as jointly funding PhD students with QuakeCoRE and various Endeavour programmes, and aligned with CRI SSIF) to maximise impact.

The Platform will also build on the deep connections established through the Resilience NSC with agencies and funders to identify opportunities for co-funding to support translation and implementation. Identifying these specific mechanisms will be an important element of project design from the outset to ensure the planned pathway for impact is appropriately resourced and key stakeholders or partners are fully on board. Engagement through the Platform design process has shown strong intent from key agencies including councils and others to identify areas where impact value can be enhanced through shared resourcing of projects (including participation by partner organisation staff) or alignment with other funding sources to extend opportunities.

Co-funding has already been secured in Year 1 (from the Natural Hazards Commission) as part of the process to identify and fund capability retention projects, which has enabled a wider range of projects and capabilities to be supported. Signalled intent for partnering for impact from a range of agencies is positive, and is anticipated to evolve into meaningful shared resourcing which will drive greater impact.

3.8 Vision Mātauranga

The Resilience Platform seeks to support Māori aspirations for disaster resilience and resilience science, aligned to wider initiatives to build capacity and capability for communities to better understand and manage the impacts of natural hazards. The inclusion of Te Ao Māori perspectives and relevant mātauranga Māori are essential elements of the Platform mission, putting people and place at the centre of disaster resilience and fostering the innovation potential of Māori knowledge, resources, and people.

The Resilience Platform strategy for Vision Mātauranga includes:

- Framing resilience research outcomes in a holistic context through He Waka Manawaroa (conceptual framework that prioritises knowledge exchange and creation between Vision Mātauranga and science, alongside stakeholders and community to enhance Aotearoa New Zealand's resilience in the future).
- This approach enables the gap between knowledge and real-world application to be bridged, delivering wider impact for enduring community resilience, alongside marae, hapū and iwi.

A two-level approach to partnership and participation is proposed:

- A national partnership emerging between the Platform and the National Iwi Chairs' Forum, to identify strategic priorities and areas of mutual benefit and impact, and
- Supporting community-driven research, co-designed and led by Māori, and resourced by the Platform (and potentially other co-funding), ensuring whānau, hapū, and iwi determine their own resilience pathways

Vision Mātauranga will build capability and capacity in resilience research through:

- Ensuring relevant Vision Mātauranga activities are embedded across all research themes, capabilities and functions of the Platform
- Fostering future kairangahau Māori and strengthening leadership in relevant mātauranga Māori, Māori science and technology through Masters, PhD and postdoctoral positions as well as partnering in research with marae, hapū and iwi
- Communicating science research undertaken in partnership with Māori researchers and iwi/hapū to ensure key messages are conveyed for maximum impact
- Recognising the value of mātauranga Māori for resilience building through community-led solutions, evidence-based initiatives and collaborative approaches with sciences and scientists.

Building on relationships and capability developed in the Resilience NSC, as well as fresh perspectives from National Iwi Chairs' Forum, the following four themes will be the focus for Vision Mātauranga in the Resilience Platform:

- **Taiao restoration and sustainability** - Environmental resilience: Restoring the mauri (life force) of land, forests, rivers, and oceans using mātauranga Māori to build sustainability of food, water, and energy; enhancing resilience through risk mapping, hazard management, and warning systems.
- **Strengthening marae against hazards and risk** - Marae resilience: Strengthening cultural and built infrastructure of marae and urupā against natural hazards; investing in resources and training to establish marae as key national response and recovery hubs.
- **Whānau & community-centred decision-making** - Community resilience: Integrating Māori values into land use, planning and management; empowering marae and hapū in emergency planning and decision-making; building partnerships for governance, legislation and community education on hazards and resilience.
- **Innovative approaches for hazards and risk management** – Resilient futures: Innovating tools, technologies, and communication systems to strengthen community trust and information-sharing; developing mātauranga Māori-driven solutions for climate change adaptation and relocation.

Capability and collaboration

Māori research strengths identified in the initial design phase of the Platform includes expertise in natural

hazards risk and resilience, climate adaptation, supply-chain resilience, marae resilience, planning, and cultural impacts. In shaping the Vision Mātauranga programme, engagement was facilitated through the Resilience NSC Rangapū Rangahau (Māori scientists and researchers) and the NSC Rauika Māngai network, connecting with Māori researchers beyond the Resilience NSC to include those previously involved in other NSCs. The National Iwi Chairs' Forum was also engaged as part of this process, drawing on iwi perspectives regarding their research priorities for resilience. As part of the detailed design work over May-July 2025, consideration will be given to specific leadership and capability requirements including opportunities for emerging leaders and new areas of capability.



SECTION FOUR:

Programme Details

4.1 Science programme

The Resilience Platform is structured (Fig 1) around three central science themes:

1. **Living with Risk**
2. **Better Resilience Decisions, and**
3. **Next Generation Risk Assessment**

The themes will provide the scale and strategic focus necessary for multi-year science activities, as well as a home for targeted shorter-term projects that address specific emerging research questions linked to the theme. Leaders of these themes will have a strategic view of resilience, be highly-regarded, highly collaborative scientists with strong domestic and international track records, who can work effectively across science disciplines and science-policy-practice interfaces to deliver impact.

These core science themes programmes are described in more detail here, along with specialist research and capability areas not otherwise described in the Plan, namely:

- Data and Enabling Technologies, and
- Resilience Catalyst Centre

Theme 1 - Living with Risk

This theme places people at the centre of risk reduction and resilience, aiming to drive a shift toward a whole-of-society approach that integrates various sectors and communities to strengthen New Zealand's capacity to plan for, adapt, respond to, and equitably and effectively recover from multiple hazard risks.

Theme 1 – Living with Risk - Programme Plan Overview	
Focus	Using mixed methods, place- and problem-based projects, and integrating closely with the other themes, this theme will develop robust new decision pathways, planning and recovery trajectories, governance frameworks, alongside innovative tools, processes, and practices.
Drivers	• The need for a people-first, integrated, 'many hazard' approach to risk reduction research • The need to shift away from reactive, short-term planning to a whole-of-society, systematic approach involving diverse sectors and partners • The need to identify and reduce structural vulnerabilities to avoid exacerbating risks, and improve the success of resilience efforts
Key research questions	• How to better live with risk, improve risk literacy and cope with hazard disruption? • What information in what formats will drive action? • How do different groups experience and respond to the impacts of natural hazards? • How does exposure to and recovery from hazards vary between groups (e.g., ethnicity, age, gender, disability), and how can disaster preparedness, response, and recovery processes be more inclusive? • How can we enable more people to take measures to adapt and increase community resilience through knowing risks, feeling empowered, and being supported where possible? • How can recovery strategies be designed and implemented now, to support community recovery and enhance resilience? • What can we learn from past event responses and recovery? Are there 'archetypes of inaction' that can help explain and efficiently diagnose barriers to action? • How does our evolving environment contribute to both disaster risk (e.g. changing populations) and solutions (e.g. technology)?

Theme 1 – Living with Risk - Programme Plan Overview	
Key research questions (continued)	How can lessons from contemporary and historical natural hazard events be applied by hapū/ iwi to increase resilience?
Sub-themes	1. Linked-up, systems thinking 2. Locally-led and centrally-supported resilience and adaptation 3. Distributional impacts and implications 4. Anticipating recovery: social and community frameworks (jointly with Theme 2)
Theme 1 workstreams 2025–2031	WS1.1 Drivers of action: <i>What motivates individuals, communities, agencies to take appropriate actions to prepare for, respond to, and recover from disasters?</i> Individuals, households, and communities often act based on a mix of perceived risks, personal experience, and external influences. These and other factors may push people and organisations to prepare for, respond to, and recover from disasters. This workstream will explore the motivations and factors – from access to information, financial support, and emergency services – that may lead to more effective interventions and accelerate action across the 4Rs. WS1.2 Archetypes of inaction: <i>Identifying and mitigating systemic barriers that have delayed/derailed past efforts at risk reduction, addressing long-term risks to enhance community resilience</i> Systemic barriers, such as limited awareness, institutional arrangements, and a range of systemic inequalities often prevent effective disaster risk reduction and impede efforts at enhancing resilience. While many of these are context-specific, common factors may repeatedly shape long-term outcomes, creating a cycle of inaction that undermines long-term resilience efforts. This workstream will identify and analyse archetypal barriers that have delayed or derailed past efforts in disaster risk reduction and resilience building, and develop and test potential strategies to overcome them. WS1.3 Distributional resilience: <i>Exploring the intersections between equity, diversity, demographics, and vulnerability</i> New Zealand’s demographic context is changing rapidly, with a growing proportion of second-language speakers and other marginalised groups who are traditionally hard to reach with emergency management and public education programmes. Equity and diversity are critical to understanding how different demographic groups are vulnerable and resilient in the face of natural hazards. Marginalised communities often have limited access to resources, information, and services, making them more vulnerable in both the preparedness and recovery phases. Addressing these inequities through focusing on inclusive and targeted approaches that leverage appropriate networks or entities (such churches, community groups, or social media groups) improves uptake of resilience initiatives, and ensures that all groups have the capacity to withstand and recover from disasters effectively. This workstream focuses on exploring the intersections between equity, diversity, demographics, and vulnerability in shaping community resilience.

Theme 1 – Living with Risk - Programme Plan Overview	
Theme 1 workstreams 2025–2031 (continued)	WS1.4 Recovery pathways: <i>Facilitating equitable and sustainable recovery processes, particularly for vulnerable communities, to enhance their resilience post-disaster</i> The aim of this project is to facilitate equitable and sustainable recovery processes, particularly for vulnerable communities, to enhance their resilience after a disaster. This will include analysis of recovery case studies to identify (un)successful strategies for equitable recovery, and lessons learned (see 1.4.1 ‘Fit-for-purpose recovery’). Recovery frameworks (e.g. ReCap) will be refined and tested, in collaboration with local and regional partnerships to test recovery models that integrate psychosocial support, economic recovery, and social support for vulnerable populations. <u>1.4.1 Fit-for-purpose recovery:</u> Post-event reviews have highlighted the need to apply lessons from recent disasters, improve recovery outcomes, and establish policies, processes, and practices that empower communities to develop grassroots resilience and local response capability in partnership with emergency management. This priority project exemplifies cross-cutting research between Themes 1 and 2 and specialist programmes. Using advances in machine learning and large language models, Theme 1 will focus on lessons learned, incorporating official reviews from multiple events and examining the impacts, contributions, and potential roles of affected communities, to synthesise new insights. Theme 2 will analyse the decision-making frameworks, funding, and responsibilities that shaped how events unfolded in practice, followed by identifying opportunities and decision points for adaptive recovery (see Task 2.5). Together, we will design a framework to underpin a more fit-for-purpose system, empowering multiple stakeholders to not only respond and recover but also adapt and improve resilience for future crises. This framework could be tested in real-time if disasters occur during the lifetime of the Platform. WS1.5 Adaptation futures: <i>Developing many hazard scenarios and trajectories to understand disruption and decision-making in a rapidly changing New Zealand</i> Anticipating and preparing for environmental and climate disruptions can safeguard welfare, security and prosperity, ensuring greater resilience. To enable actors and institutions to manage future uncertainties, navigate adaptation barriers and implement effective actions, this workstream will develop tools and processes to enhance long-term foresight, foster risk literacy, and enable action now. New integrated scenarios will be developed through collaborative and community engagement, empowering stakeholders to design adaptive strategies that safeguard communities against emerging threats.
	WS1.6 Coordination and collaboration: <i>Providing on-going support for local and regional resilience initiatives</i> Effective disaster resilience requires ongoing collaboration between local, regional, and national actors, as well as the private sector and communities. By fostering strong partnerships across different sectors, communities can ensure that resilience efforts are well-coordinated, equitable, and responsive to local needs. This workstream will assess and enhance coordination and collaboration mechanisms for local and regional resilience initiatives, develop new collaborative frameworks and communication tools to improve cross-sector cooperation in disaster preparedness and recovery efforts, and strengthen community capacity to prepare for and recover from disasters

Theme 1 – Living with Risk - Programme Plan Overview			
Priority projects 2025–2026	Archetypes of inaction: Review and synthesise lessons not learned or applied Fit for purpose recovery, jointly with Theme 2 (and supported by early work in Theme 3 and Data and Enabling Technologies) Coordination and collaboration: Re-establishing and coordinating a new living laboratory for North Island’s East Coast resilience to nationally significant earthquake, tsunami and coastal hazards (or other priorities based on the National Risk Register)		
Pathways	Deep partnerships with central government agencies, councils, hapū/iwi, emergency managers and industry groups, built over nearly two decades of collaboration, will be extended to strengthen knowledge exchange and deepen the use and application of research.		
System Outcomes	Activities and Outputs	Short-term Outcomes	Medium-term Outcomes
	• Thought leadership on disaster resilience • Innovative, impactful and excellent applied social science • Innovative, impactful and excellent Vision Mātauranga research • Innovative, impactful and excellent science communication • Novel models, tools, and forecasts • Integration and synthesis of existing and new data and information • Responsive co-development and shared delivery with users to drive uptake/impact • Investing in people to build and maintain science capability and pathways • Facilitation of international science linkages	• Decision making at all levels informed by understanding of risk and treatment options • Risk assessment and resilience decision making reflect Te Ao Māori perspectives • Improved understanding of social and economic costs drives risk reduction focus • New science-based tools, models, and forecasts inform decision making • Communities and sectors are active participants in applied resilience research	• Unified, inclusive decision-making manages hazard risk sustainably • Communities and EM system function well under stress • Hapū/iwi/Māori aspirations for DRR realised • We’ve stopped building wrong things in wrong places • Mana whenua enabled and resourced to participate as partner in resilience building • Communities use local knowledge and resources to manage DRR • Reduced inequities in disasters

Theme 2 – Better Resilience Decisions

This theme focuses on the development and refinement of information, tools and guidance to support the important decisions made by the institutions, agencies and businesses who are charged with managing risk for themselves or for others. It will move beyond resilience as being the sole responsibility for the state, and acknowledge that decision makers at all levels, and in multiple sectors, need to be aware of, and able to use fit-for-purpose tools, frameworks, and information to increase societal and environmental resilience to natural hazards. It will also analyse the regulatory environment that is critical to enabling effective design and uptake of decision-support tools, as well as exploring the specific needs of hapū/iwi for appropriate decision tools.

The theme recognises that to deliver science impact, the knowledge we generate needs to be better tailored to, and integrated into, the constraints, contexts, and requirements of the diverse range of sectors and users where increasing resilience to natural hazards is practiced. It also acknowledges that resilience science needs to better engage with real-world decision-making issues such as sequencing, dynamism, equity and uncertainty, as well as current priorities and future equity and economic risks.

This theme will draw on our existing relationships and develop new capability by working closely with our team of Knowledge Brokers and reach out to important sectors, such as financial institutions and key exporters. It will link the data on quantifying hazard risk from Theme 3 to create tailored information for differing end users. Working with Theme 1, this theme will also ensure that we better understand and consider the behavioural drivers that contribute to decision making in practice, as well as the societal and economic consequences of alternative risk actions. We will develop a deeper understanding of how risk and resilience is the responsibility of different actors, agencies or other groups such as hapū/iwi at different times within the hazard management system, and how we can enhance resilience outcomes at multiple stages and times.

Theme 2 – Better Resilience Decisions - Programme Plan Overview	
Focus	To support decisions made by the institutions, agencies and businesses charged with managing risk for themselves or for others, through robust science-based information, tools and guidance
Drivers	- Decision-makers at all levels need to be able to access and use fit-for-purpose tools, frameworks, and information to increase resilience to natural hazards - New resilience knowledge needs to be better tailored to, and integrated into, the constraints, contexts, and requirements of a diverse range of users
Key research questions	- How do we increase resilience while enabling economic growth, new development and environmental outcomes? - How do we adapt urban form, function, and land uses to reduce existing risk, or retreat from risk? - How do we better consider ‘many hazards’ in decision making, and understand how risk and responsibility moves over time and decisions? - How can we better use resilience science in financial, investment, regulatory, and business sectors? - How can we design frameworks to better allow for effective and adaptive response and recovery? - What decision-making tools can be developed (and how) that embody Te Ao Māori perspectives on risk? - What approaches are needed to support national- and local-scale risk assessments focused on resilient marae, papakāinga and te taiao? - How can risk assessments focus beyond just physical risk to assets, such as including cultural values and places?

Theme 2 – Better Resilience Decisions - Programme Plan Overview	
Key research questions (continued)	• What could planned relocation approaches to natural hazards based on mātauranga and Māori values look like? • How can natural hazards science better support decision making for resilient industry, to drive better long-term economic and wellbeing outcomes?
Sub-themes	1. Business, economy and infrastructure investment decisions and asset management 2. Land-use planning and built and natural environment adaptation 3. Risk levels and choices: risk appetite, tolerance, and empowerment 4. Anticipating recovery: legislative frameworks (jointly with Theme 1)
Theme 2 workstreams 2025–2031	WS2.1 Integrating resilience with growth and development to reduce future liability and risk This workstream acknowledges that growth is a major national focus and that we need to build significant new housing and make cost effective infrastructure investments, as well as build resilience in key sectors of the economy vulnerable to disaster, such as agriculture, forestry and tourism. We will develop new pathways and frameworks for allowing smart growth, such as innovative growth nodes or new towns beyond the binary ‘infill or sprawl’ debate, including outlining economic mechanisms to pay for strategic infrastructure investment. Rather than planning seen as a constraint on growth it will better allow growth to occur in safer places. This involves shifting from ‘single-hazard’ to ‘many-hazard’ planning, developing novel, multi-sector economic evaluation and financing tools to better assess and balance current and future hazard risks, growth pressures, land-use choices, business investment activities, regional development and future economic aspirations. WS2.2 Choosing resilience: Developing a robust approach to evaluating and applying risk tolerance to inform decisions There is a need to develop a robust approach to evaluating and applying risk tolerance to inform decisions, ranging from national policy settings through to local land-use planning and infrastructure planning. This involves the legal interpretation and application of societal-risk settings, Te Ao Māori perspectives on risk tolerance, methods for eliciting risk tolerance perspectives, and methods for evaluating risk-bearing capacity. It also involves considering how temporal and diverse individual and societal risk-tolerance perspectives are dynamically integrated into policy, investment, and planning decision-making, including evaluation and consideration of trade-offs. This is a cross-cutting project with Theme 1 and Theme 3. WS2.3 Multiple hazard infrastructure planning, economic evaluation and investment This workstream will develop adaptive decision-support tools and frameworks, deepen understanding of organisational cultures and rationalities, and enhance risk literacy to support public and private investment that best prioritises and allocates resources across the many and uncertain hazards we face now and into the future. The workstream will analyse how disaster risk science links to economic, business and financial rationalities and calculations, in particular investment signals, insurance, compliance and regulatory systems, the discounting of future risks, and developing tools to support decisions that can better acknowledge and manage current and future risk. In response to growing litigation, we will focus on the role of negligence, liability and compliance in risk decisions and how risk and responsibility moves through hazard decision-making systems and is transferred from one institution to another.

Theme 2 – Better Resilience Decisions - Programme Plan Overview

	WS2.4 Retrofitting resilience and enabling adaptation of existing land uses Much of the risk we have currently is due to previous decisions and there is an imperative to adapt existing land uses and regional economies to reduce risk and disruption, and to retreat from places where risks are intolerable. These measures are typically more difficult to implement than preventing new development due to multiple uncertainties, such as performance of nature-based solutions, impacts of climate change, who pays, existing property rights, place attachment and issues of retreat or realignment. This project will identify, quantify, and create practical pathways and a toolkit of approaches for retrofitting adaptation in urban and rural areas, subject to significant present-day and future risks. WS2.5 Anticipatory resilience for adaptive recovery The tendency in the wake of disasters is to try and restore normality, but this tendency may not increase resilience to the next event nor adapt to a future with an increased frequency of extreme events. This project will be undertaken jointly with Theme 1 linking to their focus on ‘learning from the past’ (see Theme 1 WS1.4.1). The contribution of this project will involve a focus on the structures and frameworks that shape decision making. Through engagement with emergency management professionals, hapū/iwi and communities at risk, we will develop an anticipatory resilience framework able to inform real-time recovery and identify key areas and pathways for enhancing future resilience. This will include a review of the governance, legal and regulatory environment that supports recovery. Through a comparative analysis of international and New Zealand frameworks, recommendations for recovery instruments will be developed with key stakeholders. The impact of existing legislation and recovery arrangements will be integrated into the recovery model in the form of delays and risk factors.		
Priority Project 2025–2026	Anticipatory resilience framework: This priority cross-theme project will prepare the Platform to contribute towards adaptive recovery, resulting in a framework that will be available to test in a real event recovery.		
Pathways	Early and continual engagement with key decision-makers in central and local government, hapū and iwi, business, and communities, to ensure our science meets user needs and our outputs, tools and frameworks are designed to meet those needs.		
System Outcomes	Activities and Outputs • Thought leadership on disaster resilience • Innovative, impactful and excellent applied social science • Innovative, impactful and excellent Vision Mātauranga research • Innovative, impactful and excellent science communication • Responsive co-development and shared delivery with users to drive uptake/impact	Short-term Outcomes • Risk information is easily used in decisions of what, where, and how we adapt and build/rebuild • Decision making at all levels is informed by understanding of risk and treatment options • Risk assessment and resilience decision making reflect Te Ao Māori perspectives	Medium-term Outcomes • Less damage, disruption, and death from natural hazards • Unified, inclusive decision-making managed hazard risk sustainably • Hapū/iwi/Māori aspirations for DRR realized • Insurance available as part of optimized risk treatment • Reduced inequities in disasters

Theme 2 – Better Resilience Decisions - Programme Plan Overview

System Outcomes (continued)	• Data and information gaps identified • Novel models, tools, and forecasts • Integration and synthesis of existing and new data and information • Science-informed guidance and policy briefs • Investing in people to build and maintain science capability and pathways • Facilitation of international science linkages	• Platform science informs relevant policy, plans and practice at all levels • Platform’s coordination of post-event science response is adding value • New science-based tools, models, and forecasts inform decision making • Communities and sectors are active participants in applied resilience research	• Communities and EM system function well under stress
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Theme 3 - Next Generation Risk Assessment

This theme addresses the need for advancing understanding of natural hazard processes, the development of consistent and comparable hazard and risk information, and the elicitation of robust assessment methodologies for the built, natural, and human environments that supports decision making about disaster risk and resilience.

The theme will refine understanding of hazard processes critical for assessing relevant natural hazards and their consequences,⁴ (drawing on links to other hazard programmes), develop and iteratively test new methodologies for quantifying and combining the risks for multiple hazards, and explore the effects of cascading, coincident and compounding hazards on risk. These data will identify potential regional/local focus areas, provide context for place-based projects and support an integrated approach to the development, testing and prioritisation of innovative risk treatments and recovery strategies with other parts of the Platform.

Through this theme (informed by and integrated with other themes) the Platform will look to apply lessons from past events to improve the assessment of existing risk, and explore the implications of different risk-treatment options for current and future trajectories of the built, natural and human environments, at different spatial scales, across different timeframes and by diverse users.

Theme 3 – Next Generation Risk Assessment - Programme Plan Overview	
Focus	To support decision-making through improved understanding of natural hazard processes, consistent and comparable hazard and risk information, robust assessment methodologies, and the development of innovative risk treatment options.
Drivers	• The need for improved understanding of natural hazard processes and their consequences for the natural, built and human environments • The need for consistent and comparable hazard and risk information and assessment methodologies • The need for an integrated approach to developing, testing and prioritising innovative risk treatment options
Key research questions	• What hazard data is needed to support different aspects of decision-making, at different spatial and temporal scales? • Can we develop New Zealand-applicable vulnerability models for built, natural, cultural and societal components? • How will the characteristics and spatial distributions of the built, natural and human environments change with time, and what are the implications for future risk trajectories? • What are the direct, indirect and economic risks associated with different natural hazards, and how can we represent the combined risk and directly compare risk across these hazards? • What are the effects of cascading, coincident and compounding hazards on risk across different timeframes? • How important is the timing of implementation of risk treatments for reducing future risk? • Can we simulate the recovery of the built, natural and human environments after hazard events and test different recovery strategies? • What data resolution and methods can support risk-based decision making at different spatial and temporal scales?

Theme 3 – Next Generation Risk Assessment - Programme Plan Overview	
Sub-themes	• Hazard: Coordination, standardisation, prioritisation, scenarios, and interactions • Exposure: Dynamic built, natural, population, and societal databases • Vulnerability: Existing conditions, emerging conditions and interventions/retrofit/design (built, natural, societal, cultural environments) • Systems: Infrastructure, people, critical sectors, and interventions/retrofit/design (built, natural, societal, cultural environments) • Risk and impact: Direct, indirect, economic, prioritisation, and characterisation • Scenarios: Showcase hazard events, future trajectories, response, recovery, reduction, and risk treatments • Risk treatments: Interventions and adaptations - modify hazard, reduce exposure and vulnerability, and manage consequences. Designed and used by Themes 1, 2 and Vision Mātauranga to reduce risk in collaboration with impact partners
Theme 3 workstreams 2025–2031	Capabilities and outcomes from the Resilience NSC and other external natural hazard research programmes form the foundations from which to build iterative representations of natural hazard risk in this theme, with a strong shift towards a future focus – that is, the development and testing of innovative risk treatments, exploring potential future trajectories of the built, natural and human environments and the development of recovery strategies (linked to the cross-cutting priority for Themes 1 and 2). The workstreams (WS) and their linkages are summarised in the figure and list that follows: WS3.1 Hazard, Exposure and Vulnerability This workstream focuses on the coordination and standardisation of existing hazard, exposure and vulnerability data, and the risk-based prioritisation of new research in these areas. This is critical for advancing natural hazard risk research to combine and compare present and future risk from different natural hazards. Hazard data for applications at different spatial and temporal scales will be modelled using novel technologies, including both isolated hazards and cascading, coincident and compounding hazards. Exposure datasets for New Zealand’s built, natural and human environment components will be enhanced based on the integration of data from disparate sources. Vulnerability and fragility models (damage, cost, functionality, casualty) representative of New Zealand characteristics will be developed for the effects of isolated and combined hazards. Data from case histories, physical modelling, numerical modelling and expert elicitation will be used to test different data-science methods for vulnerability/fragility model development. WS3.2 Systems Dynamics and Dependencies Projects will advance the representation of the dynamic characteristics of critical infrastructure networks, both for individual networks and the dependencies between multiple networks. This will include the dynamics of the critical sectors and customers that require critical infrastructure to function, such as logistics networks and emergency services. As the movement of people plays a key role in exposure and risk, dynamic models for different characteristic populations will be simulated. Quantification of dependencies across the built and human environment will further advance our understanding of risk and support a more holistic data-driven approach to the criticality of built environment components and systems.

Theme 3 – Next Generation Risk Assessment - Programme Plan Overview

Theme 3 workstreams 2025–2031 (continued)

WS3.3 Risk and Event Scenarios

WS3.3 combines the components from WS3.1 and 3.2 to quantify the consequent impact and risk. This will include the direct and indirect impacts and risk to physical components from WS3.2 and the wider economic impacts and risk to society through linkages with the other themes. Different single-hazard scenarios, scenario ensembles, cascading, coincident and compounding hazard scenarios and probabilistic hazard intensities and frequencies will be modelled and assessed. Methods to combine and compare the implications and risk across multiple isolated natural hazards will be developed and tested. Critically, this will explore the influence of data and model resolution/aggregation on hazard, exposure and risk estimates at different spatial and temporal scales.

WS3.4 Risk Treatments, Risk Trajectories and Recovery

Innovative risk treatment options will be developed in conjunction with other themes and the influence of these options quantified using the methods in WS3.3. Built environment component and system intervention options to reduce vulnerability (engineering retrofit and design) will be identified through numerical and physical modelling. Similarly, protection measures to modify hazards and planning approaches to reduce exposure or manage consequences will be developed and assessed. Different future trajectories of the physical and spatial characteristics of the built, natural and human environments will be created to assess future risk and identify potential future ‘tipping points’. Using these different futures, the influence of the timing of single or multiple interventions on risk will be tested and optimised. While risk treatments can increase resilience, there may still be adverse effects following hazard events and the need for efficient and effective recovery. New approaches to simulate physical recovery scenarios will be used to test strategies and be evaluated based on prioritisation targets defined by other themes. The linkages across these workstreams and into the other themes are summarised in the figure below:

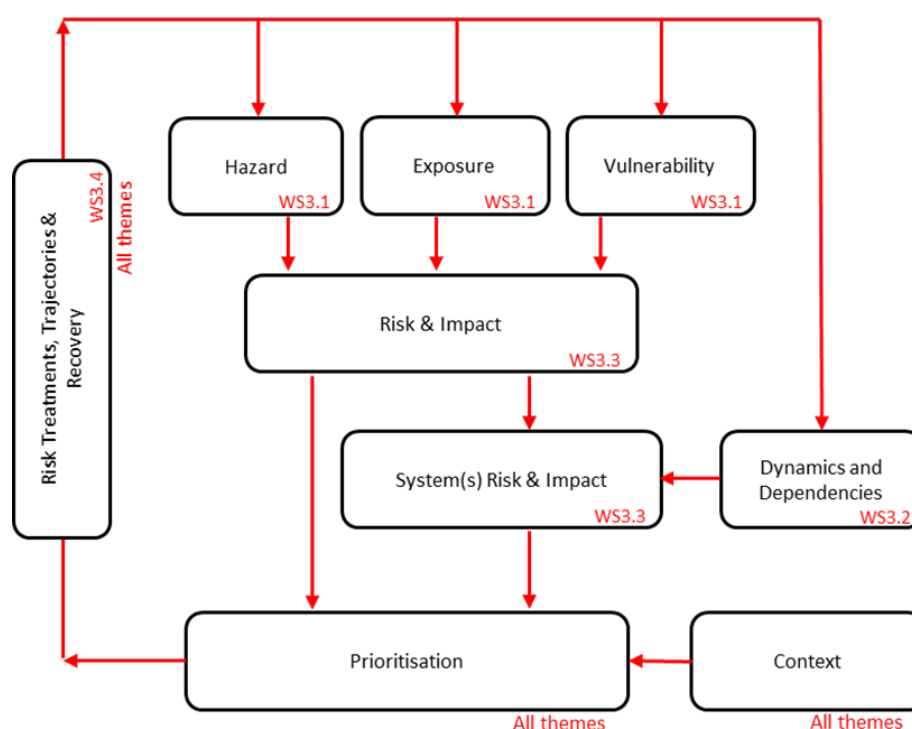


Figure 4. Relationship between the Theme 3 workstreams (WS) and the other themes of the research programme. This structure will be applied to risk assessments, scenarios, and multiple iterations combined when looking across multiple isolated hazards.

Theme 3 – Next Generation Risk Assessment - Programme Plan Overview

This theme will develop research projects framed against a spatial and a temporal dimension which will sit within or across the workstreams described above (with most projects intended to cross-cut multiple workstreams). The spatial dimension includes national, regional and local-scale projects, with projects able to focus down from a larger to a smaller scale or scale up from local to a wider scale. The temporal dimension spans from the past, through the present and to the future, with projects able to cut across different temporal dimensions. The past looks to previous events for lessons and for training data to inform present and future assessments. The present assesses current conditions of the built, natural and human environments to provide forecasts of impact and risk for single and multiple hazards, and now-casts/impact warnings for scenarios and oncoming events. The future explores and tests innovative risk treatments, the influence of future trajectories and simulates the recovery following different hazard events. Examples of potential projects are summarised in the figure below.

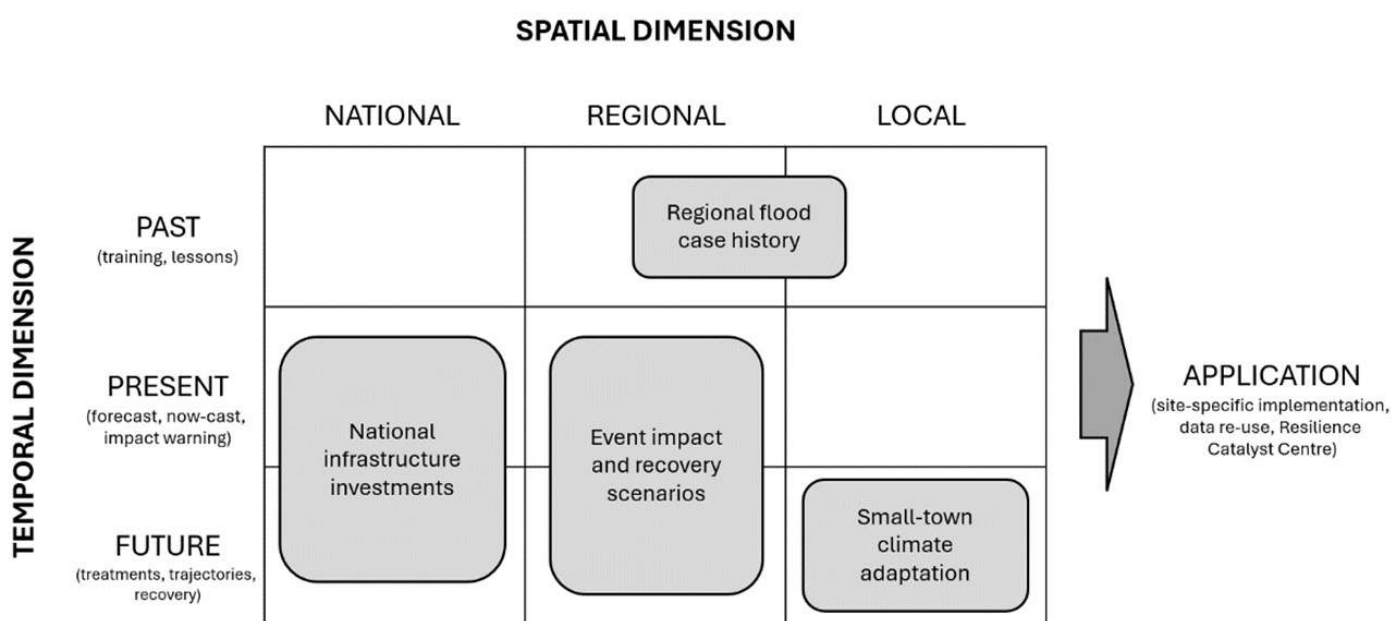


Figure 5. Matrix of research structure assigned based on spatial and temporal scales. Projects can sit within one sector of the matrix or cut across multiple sectors, with some example projects provided. Research outcomes can be applied through impact partners, data re-use or through Resilience Catalyst Centre projects.

Theme 3 – Next Generation Risk Assessment - Programme Plan Overview

Priority Projects 2025–2026

Based on strong user and next user demand, priority work in the first 24 months will address:

- The first iteration of the aggregation and standardisation process for components of national and regional natural hazards risk assessment.
- National-level exposure and first-iteration (screening tool) risk assessment based on:
 - Nationally consistent natural hazard datasets
 - Nationally consistent exposure datasets across all natural hazards
 - Dynamic population exposure models
 - Testing of exposure/risk combination approaches for various applications

The early outputs will inform prioritisation of the next steps in the research. This will identify key hazards where existing understanding of hazard process, datasets and models (hazards, exposure and vulnerability) require improvement to allow more strategically targeted hazard studies.

Theme 3 – Next Generation Risk Assessment - Programme Plan Overview

Pathways	Internal next users: Data and analysis provided to support the work of other themes, and testing of risk treatment options in collaboration with other themes. External users: Research projects will be co-designed and co-produced with users, particularly at local and regional scales.		
System Outcomes	Activities and Outputs • Innovative, impactful and excellent physical science • Innovative, impactful and excellent engineering science • Innovative, impactful and excellent Vision Mātauranga research • Novel models, tools and forecasts • Data and information gaps identified • Integration and synthesis of existing and new data and information • Responsive co-development and shared delivery with users to drive uptake/impact • Leveraging new and emerging technologies • Spin-off research opportunities enabled • Facilitation of international science linkages Investing in people to build and maintain science capability and pathways	Short-term Outcomes • Unified national view of multi-hazard risk • Nature and scale of multi-hazard processes and consequences better quantified • Risk information is easily used in decisions of what, where, and how we adapt and build/rebuild • New science-based tools, models, and forecasts inform decision making • Decision making at all levels is informed by understanding of risk and treatment options • Improved understanding of social and economic costs drivers risk reduction focus • Risk assessment and resilience decision making reflect Te Ao Māori perspectives • Emerging pipeline of science talent and new leaders • Platform is key advisor to the national risk management system	Medium-term Outcomes • We've stopped building the wrong things in the wrong place • Less damage, disruption, and deaths from natural hazards • Risk reduction and adaptation is integrated across all development • Unified, inclusive decision-making managed hazard risk sustainably • Insurance available as part of optimized risk treatment • Hapū/iwi/Māori aspirations for DRR realised

Data and Enabling Technologies

This cross-cutting capability and innovation programme will leverage advances in data application and tools and other ICT-based technology, and integrate closely with the core science themes and Vision Mātauranga to extend Platform innovation capabilities. Stakeholder engagement as part of the Plan development has identified significant opportunities to build connections and advance capability in this area in service of the natural hazards resilience mission.

As a relatively immature dimension of some aspects of the disaster risk reduction sector, a staged approach to building necessary capability is planned, working closely with the science themes as appropriate:

Stage 1: Jul-Sept 2025 - Scoping and Curation

Stock-take/landscape analysis of existing data and related infrastructure. Build on federated data platforms and catalogues (such as the National Environmental Data Catalogue) and scope partnership with portal developers like the Natural Hazards Commission. Compile data-quality indicators where possible, plus information on control over/access to/subsequent use of data. Identify quick-win options to improve data interoperability across agencies.

Stage 2: Sept 2025-Sept 2026 - Collaboration and Co-Design

Data scientists, AI researchers, research software and hardware engineers and usability experts will work with Resilience Platform science teams to co-create prototype solutions for both science theme research questions and technology-driven research questions and consider future innovation opportunities.

Stage 3: Sept 2026-2031 - Innovation

Pending securing end-user co-funding, joint science and technology teams co-develop and deploy scalable, fit-for-purpose solutions under license in their end-user organisations. Consider potential for spin-outs to complement license deals and public good outcomes.

Candidate-enabling technologies will likely sit across:

- data science and AI models/tools (including predictive and generative AI)
- data infrastructure solutions
- bespoke algorithms and non-AI models
- geospatial visualisations and other engagement technologies (e.g., AR/VR; digital twins)
- smart sensors and robotics
- ICT-enabled situational awareness

Resilience Catalyst Centre

The Resilience Catalyst Centre will sit at the nexus of science innovation and research impact in service of the collective resilience mission. The concept for the function arises from experience in the later stages of the Resilience NSC, where approaches were made by agencies to mobilise science capability at short notice to deliver specific inputs for national policy programmes. The proposed function will operate as a 'shopfront' for all potential research users including central and local government stakeholders, iwi and Māori, critical infrastructure providers, finance and insurance sectors, businesses, communities, and others.

The hub has three main purposes:

1. **A brokering function to connect users with relevant science capability**, both inside and external to the Platform
2. **An agile innovation hub to address urgent or emerging needs** of key stakeholders, through mobilisation of relevant capability and, where relevant, spooling up research activities to test ideas or develop solutions.
3. **A convening mechanism** to bring groups of scientists and users together to address emerging or priority issues of relevance to both (for instance new legislation).

This will provide a streamlined interface for new users or existing partners looking to solve specific problems or issues that could benefit from rapid or seed-type projects, or simply facilitated action requiring mobilisation across a number of science programmes and agencies. The intention of this function is not to act as a paid consulting service but rather to broker solutions with the need for science inputs, and identify and stimulate innovative research opportunities. As part of triaging requests, where the work is most appropriately delivered by an external party (for instance a consultant) these requests will be re-directed. Any new projects will be funded through new co-funding, or where a significant research innovation opportunity arises, a combination of re-prioritisation of existing work and some level of co-funding. The Centre will work closely with the HRRA and Data and Enabling Technologies areas to enable the appropriate connectivity externally, and leverage innovation work where relevant to initiatives in data and enabling technology.

Fast-Start Capability Retention Projects

As part of the establishment of the Platform, GNS Science (as Platform Host) was asked by MBIE to provide some 'fast-start' funding (up to \$3.5M, with no more than \$2.5M in the first year) to ensure continuity of resilience mission-focused research and collaboration during the establishment phase of the Resilience Platform. To that end a Call for Proposals was issued soon after the SSIF Platform Head Contract was signed at the end of November 2024, with funding, in the first instance, targeted at priorities identified by MBIE, being:

- Synthetic seismicity research
- Research connections with Māori, especially in relation to volcanology and infrastructure
- Capacity for coordinated research responses to disruptive hazard events

The Establishment Advisory Group (EAG) recommended to increase the contingency for post-event science response (noting the potential scale of effort required and resourcing that might be needed prior to contracting longer-term Platform research programmes), and to prioritise early-career researcher capability at imminent risk, balanced with MBIE priorities and likely future Platform focus areas.

A total of 28 proposals requesting over \$7.7M were received, which all broadly met the criteria of the call. Declined proposals were determined on the basis of one or more of:

- No apparent urgent case for supporting capability (with some projects potentially relevant for future funding in the yet-to-be-developed Platform research programme),
- Poor linkages to Resilience NSC capability
- Poor alignment to MBIE and EAG priorities
- Insufficient evidence that the work was unique and of high impact and relevance to the resilience mission

A total of 11 proposals totalling \$2.97M were funded across the MBIE and EAG priorities, with a post-event contingency of \$0.9M, and include emerging capabilities in computer simulation for earthquake and tsunami hazard modelling, Māori partnerships, volcanic hazard process and impacts forecasting, coastal hazards assessment and adaptation planning, and community-based risk assessment and preparedness. Additional co-funding of c. \$0.5M was secured from the Natural Hazards Commission enabling additional funding to c. \$3.95M.

Science theme detailed design phasing for the next stages of 2025

Theme leaders will use science theme frameworks to form an appropriately skilled multi-disciplinary research team, based on agreed selection criteria, as well as manage the coordination and integration needed with the other themes and capability areas. It is envisaged that principal investigators will provide the necessary technical leadership for each of the identified workstreams, and that these PIs (as well as team members) may be involved in more than one workstream. Priority projects (listed in the theme summaries) will be scoped as an initial phase of longer-term programme design, with contracting these 'rapid' projects expected no later than July 2025.

Each theme will involve a mix of well-established and highly-regarded senior researchers, early career and emerging scientists, including post-doctoral researchers and Masters and PhD student projects. They are expected to involve a portfolio of longer-term programme activities (as determined through negotiation) and a collection of discrete, short-term projects, including those funded through contestable processes or jointly funded with other science partners. Teams will include both known Resilience NSC capability, and relevant and qualified new entrants aligned to the theme needs.

Adaptability of programme priorities will be facilitated through a combination of flexible contracting and active management of unallocated research funding through the life of the programme to allow for new opportunities, balanced with the need to maintain continuity in key areas.

Transition to Implementation: Indicative Activities		
Development activity	Tasks	Timeframe
Appoint senior leaders for science themes, Vision Mātauranga, and Data and Enabling Technologies	Develop selection and evaluation criteria Write role descriptions Issue EOI Evaluation of applications Appoint leaders	April 2025 April April End of April May
Appoint Platform leadership and management	Revise position descriptions Appoint key positions	June
Establish International Science Panel	Identify relevant international experts Develop TOR Approach candidates Convene ISP	April 2025 April May June-Aug
Develop multi-year theme and programme plans	Theme/programme leaders assemble teams based on agreed criteria (see leadership section) Plan and deliver phasing and priorities workshops for the three central science themes and VM, including engagement for implementation partner participation Plan priority projects across all five programmes Connect and integrate across themes and programmes Engage and iterate	May-June May-July May-July July-Aug
Approve priority projects and programmes	ISP evaluation and recommendations Steering Group advice and recommendations	June-July July-Aug
Approve priority projects and programmes (<i>continued</i>)	Host endorsement Theme Contracting	Aug Aug-Oct

Transition to Implementation: Indicative Activities		
Develop post-event science coordination function	Sector workshops to develop and test scope and elements and options Evaluate preferred option Steering Group evaluation and recommendations MBIE agreement on scope Develop role description Appoint functional lead (as appropriate)	April-June June/July July July Aug/Sept Sept-Oct
Establish Data and Enabling Technologies programme	Lead identified and appointed Engagement to connect with relevant capability Integrate with science themes Design process and identify early projects Iteratively develop long-term programme ISP evaluation and recommendations PSG advice and recommendations to Host Approve and contract	May May-July May-July June-July June-Aug Aug-Oct Oct-Nov Dec-Jan 26
Scope and establish Knowledge Mobilisation function	Develop and agree functional scope Develop role descriptions for any associated roles (e.g. Knowledge Broker) Confirm priorities and develop work plans	Feb-Mar 2026 Mar-April 2026 April-May 2026
Formalise ongoing Steering Group	Revised ToR Confirm membership Appoint/reappoint members and Chair	June 2025
Scope other enabling functions; Hazards and Resilience Research Alliances, Resilience Catalyst Centre	Develop and agree functional scope	Mar- 2026

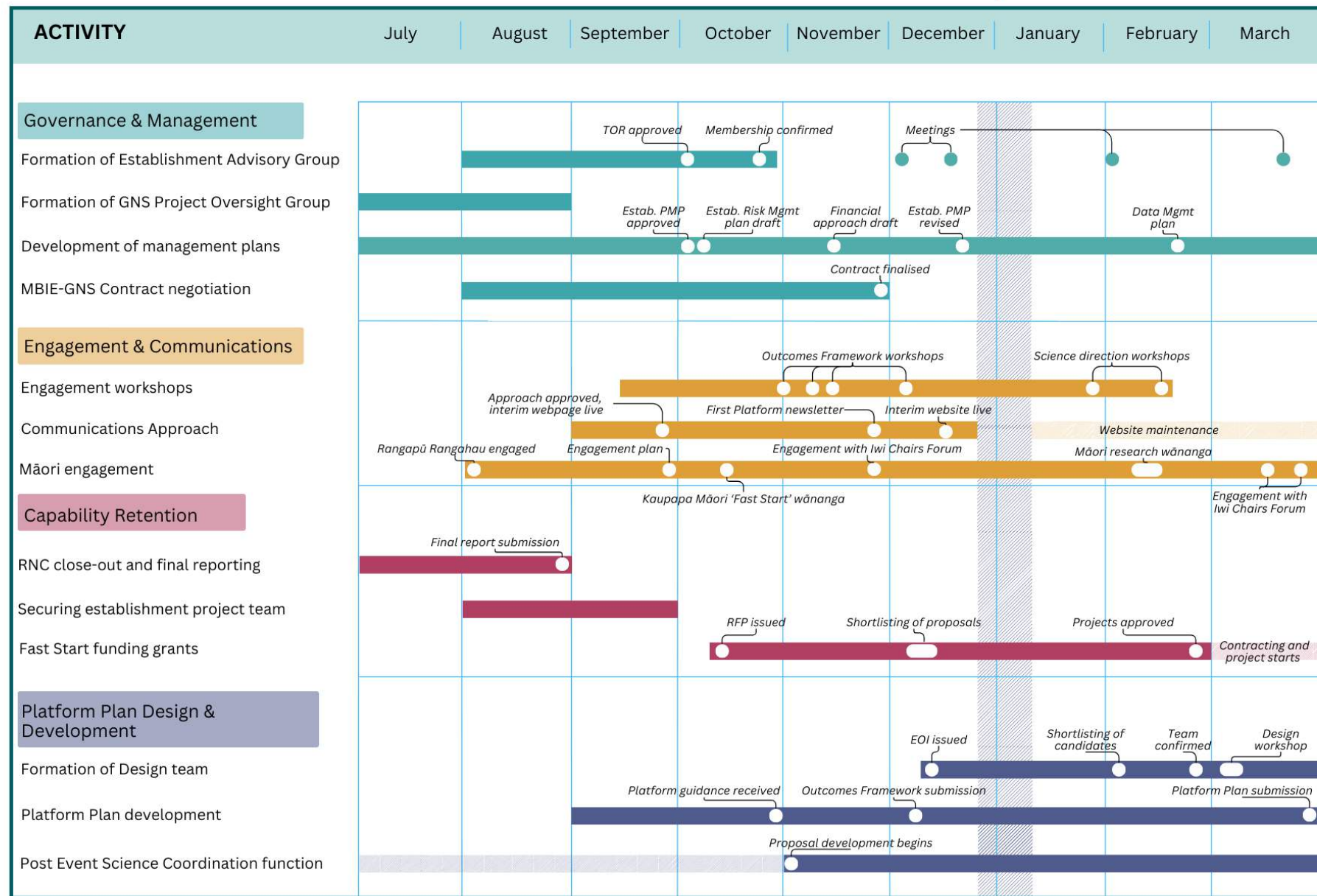


Figure 6. Detailed design phasing for the Resilience Platform through to June 2026

Indicative Phasing through to 2031

The following diagram shows a graphical indication of how we anticipate intensity of effort to vary across the science themes, cross-cutting programmes, and enabling functions over the life of the Platform.



Figure 7. Indicative phasing of effort in the Resilience Platform through to 2031

4.3 Development of Platform Plan

We adopted a best-endeavours approach to Plan development due to the highly constrained timeline for establishment and multiple parallel workstreams required for establishment including simultaneously closing out the ten-year Resilience NSC programme (see Fig 4). Notably this was also during a time of major organisational change for the host organisation, creating considerable uncertainty and disruption for staff and significant delays in decision making. We undertook Platform Plan development in an intensive but phased way, striving for broad participation in defining our strategic goals and identifying research needs and priorities, while fostering new connections.

The first phase focused on end users and implementation partners for determining the strategic direction and needs at both national and local levels. As part of workshop planning, we leveraged the membership of the Establishment Advisory Group to ensure deep reach into key sectors including emergency and natural hazards management, local and central government, iwi / Māori, infrastructure, and insurance. Four stakeholder workshops were held from the 31 October 2024 through to mid-December 2024, three in person and one online. Additionally, a series of mostly online hui and wānanga were held with Māori researchers, and there was additional engagement with National Iwi Chairs' Forum members. The establishment team also met one-on-one with a range of potential implementation partners who could not attend scheduled workshops, including from central government agencies, local government emergency management, and insurance and banking sectors.

Input and feedback from these workshops were remarkably consistent across the user engagement sessions, with clear themes emerging early which have become the focus of the outcomes and impacts in the Platform outcomes framework (Fig 2). The second phase of workshops following the summer break shifted focus to research priorities aligned to user needs and outcomes. These workshops also provided an opportunity for further feedback and refinement of the outcomes framework as a guide to determining research priorities and pathways to impact. In total across these two phases of engagement we estimate we had over 360 participants.

The third phase of Plan development involved three days with a design team of 14 scientists and resilience policy and practice experts, processing the outputs from the workshops to develop relevant research themes and programmes. Additionally, the design team considered approaches to balancing maintenance of capability and building new capabilities for emerging and future needs, enabling innovation, partnering for impact, phasing investment, enabling flexibility, and science and programme leadership and governance.

Plan feedback

An overview of the Platform research structure and key elements of the draft Platform Plan were presented to the Establishment Advisory Group (EAG) in mid-March for feedback and advice. The EAG were strongly supportive of the core science themes, new areas of focus, and the intentions for delivery of impact and wider benefits through the various enabling functions. EAG advice on language and framing was incorporated. The Host Oversight Group reviewed the Plan and endorsed the strategic rationale and science programme structure and provided feedback on phasing and the scope of enabling functions which has been incorporated. The design team reviewed the draft plan and provided detailed feedback which has been incorporated in the submitted document. The Rangapu Rangahau (rōpū of Māori researchers) provided feedback on the overall approach and specific elements and priorities for Vision Mātauranga.

Natural Hazards and Resilience Platform Design Team (February–March 2025)		
Full Name	Organisation	Email Address
Julia Becker	Massey University	J.Becker@massey.ac.nz
Charlotte Brown	Resilient Organisations	charlotte.brown@resorgs.org.nz
Nick Cradock-Henry	GNS Science	n.cradock-henry@gns.cri.nz
Shari Gallop	Pattle Delamore Partners	Shari.Gallop@pdp.co.nz
Tamzin Linnell	WSP	Tamzin.Linnell@wsp.com
Stephen MacDonell	Te Herenga Waka Victoria University of Wellington	stephen.macdonell@vuw.ac.nz
Caroline Orchiston	University of Otago	caroline.orchiston@otago.ac.nz
Ceridwyn Roberts	Ceridwyn Science Communication	ceridwyn.roberts@ceridwyn.nz
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Due to the very short time interval between research prioritisation workshops and development of the draft Platform Plan (and demands from the other Platform activities being managed in parallel, such as the capability retention grants), we propose to update workshop participants in early April on the priorities and approaches that have been determined and invite their further involvement in the next stages. There will be further opportunities for input and deeper user and researcher collaboration to shape the themes and projects through May-August as part of detailed programme and project design. We think it is important to the long-term success of the Platform that enough time is given to this next stage of design to ensure opportunities for wide participation.

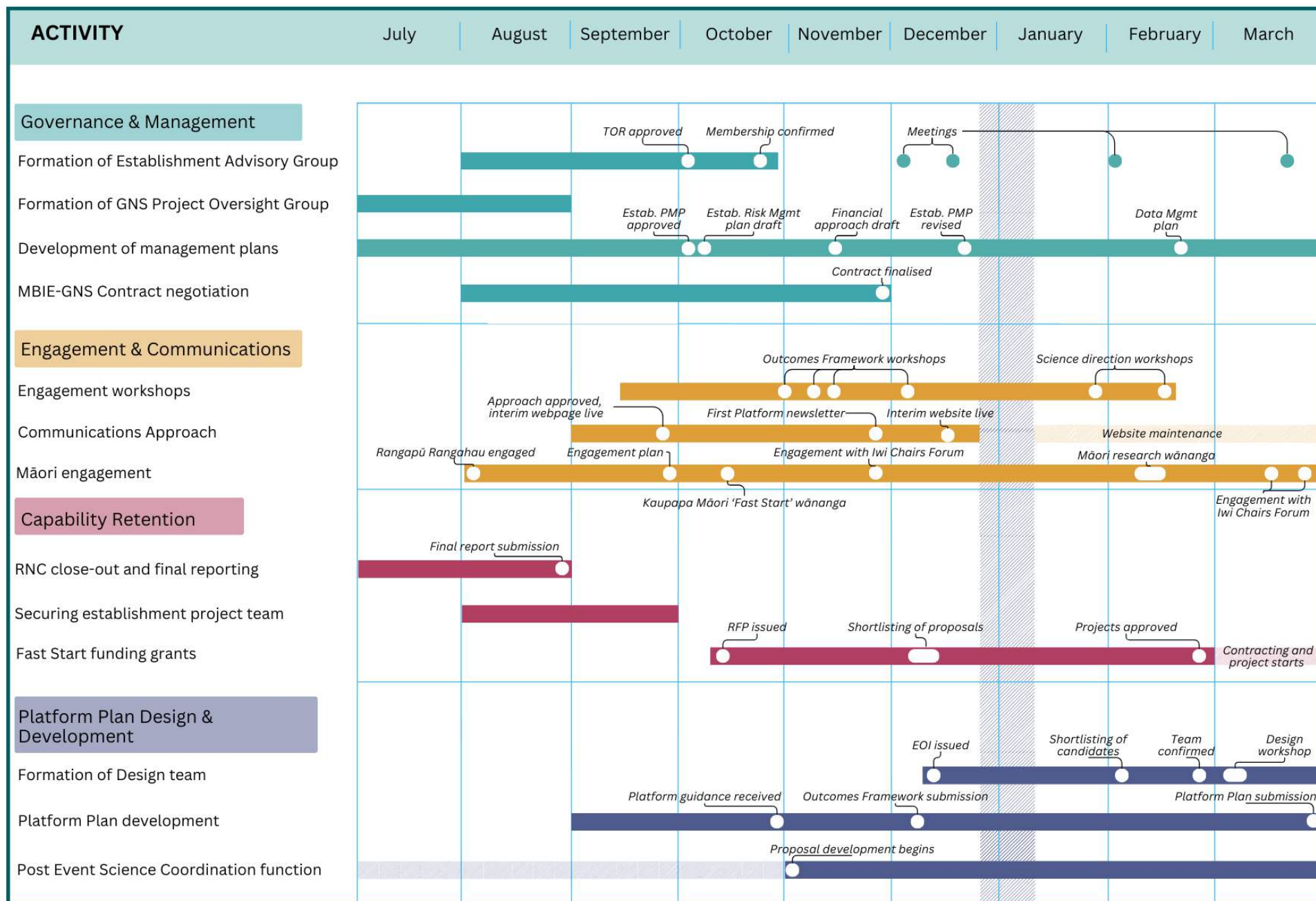


Figure 8. Timeline of key establishment activities for the Resilience Platform



SECTION FIVE:

Programme Governance,
Leadership, and Management

5.1 Governance and advisory bodies

The Platform will be governed through a Host Oversight Group comprised of relevant General Managers and Chief Scientists of the host organisation (GNS Science, until 30 June 2025, and the new Earth Sciences New Zealand Public Research Organisation from 1 July 2025), supported by an independent expert Platform Steering Group (PSG).

The PSG will provide advice and recommendations on strategic direction, research priorities, and science impact to the Oversight Group who will approve key decisions. The PSG will provide system-wide horizon scans and inform consideration of emerging issues and opportunities for the Platform over the life of the programme. The PSG will be made up of highly-regarded individuals representing key implementation partner organisations or sectors relevant to the Platform purpose, and be chaired by an independent person appointed by the Host.

The first phases of establishment of the Platform have been supported by an independent Establishment Advisory Group (see table below), and this group will continue in its current form and membership until 30 June 2025. As at 16 June 2025, the Platform structure (see figure) and advisory terms of reference have been updated and agreed. Steering Group membership (using the existing skills matrix) will be reviewed and updated as required, as per MBIE's request of 14 July 2025.

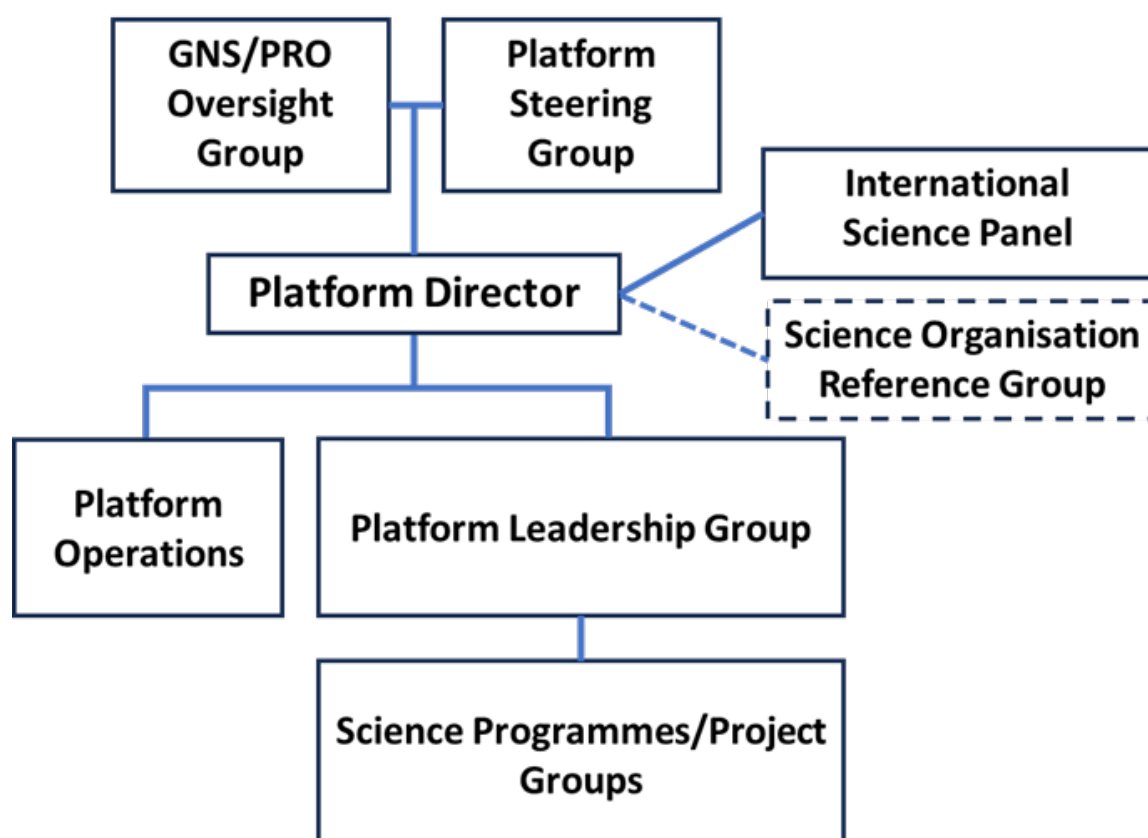


Figure 9. Governance and management arrangements for the Resilience Platform

Establishment Advisory Group (until 30 June 2025)			
Full Name	Role	Organisation	Email Address
Dame Juliet Gerrard	Chair	University of Auckland (Professor)	J.gerrard@auckland.ac.nz
Kiritapu Allen	Member	National Iwi Chairs' Forum, Te Pou Take Āhuarangi (Lead Advisor)	KLA@kiri Allan.com
Alison Collins	Member	Ministry for the Environment (Chief Science Advisor)	Alison.Collins@mfe.govt.nz
Jo Horrocks	Member	Natural Hazards Commission Toka Tū Ake (Chief Resilience and Research Officer)	jo.horrocks@naturalhazards.govt.nz
Iain Maxwell	Member	Te Uru Kahika (Executive Director)	iain.maxwell@teurukahika.govt.nz
Ross Roberts	Member	Auckland Council (Chief Engineer)	robertr3@aklc.govt.nz
Thomas Wilson	Member	National Emergency Management Agency (Chief Science Advisor)	Thomas.Wilson@nema.govt.nz

International Science Panel

An International Science Panel (ISP) will be established during June-August 2025, to provide independent expert advice on research excellence, programme design and international relevance. Membership will be on the basis of relevance of technical expertise to the Platform science programmes, international standing, and understanding of the New Zealand context.

The PSG and the ISP will play critical roles in understanding emerging issues and opportunities and monitoring and evaluating when programme priorities might need to change. On an annual basis, as part of forward-planning, we will utilise the PSG (and user participants in project teams) to undertake a horizon-scan to consider changing user needs and science capabilities.

Science Organisation Reference Group

Consideration will be given through the latter part of 2025 to establishing a reference group of participating science organisations as a means of building cooperation among institutions that are the home for much of the science capability relevant to the Platform mission.

5.2 Science Leadership *Updated 28 July 2025.*

The following people have been appointed to leadership positions for the Platform:

Platform Director	Dr Richard Smith	Earth Sciences NZ
Theme Leader Living with Risk	Associate Professor Julia Becker	Massey University
Theme Leader Better Resilience Decisions	Professor Iain White	University of Waikato
Theme Leader Next Generation Hazard Risk Assessment	Professor Liam Wotherspoon	University of Auckland
Pou Whakahaere - Vision Mātauranga	Melanie Mark-Shadbolt	Te Tira Whakamataki
Programme Leader - Data and Enabling Technology	Dr Bill Fry	Earth Sciences NZ

These leaders will initially be contracted for their leadership role time and subsequently be amended as research elements are contracted. Within the five themes/programmes, a co-leader may be appointed to provide depth and who would be jointly responsible for leadership in the theme/programme. This co-leader may be an emerging scientist with leadership potential who can be mentored in the role by the senior leader. The programme co-leaders would not be a member of the Platform Leadership Team. Principal Investigators will be identified as part of the negotiated design process for each theme/programme.

Note: Some sections and appendices have been removed from this shortened version of the Platform Plan, including indicative budget, risk management and data management plans.

Note: Some details shown in the indicative timing and detailed design phasing for the next stage of development (e.g., Figure 6) have changed since completion of this Platform Plan version.



Image: Participants at early Platform Engagement workshops. Credit: Elton Mcaleer

Appendix One: Glossary of Acronyms

Acronyms	Description
4Rs	Reduction, Readiness, Response, Recovery
AF8	Alpine Fault magnitude 8 (Alpine Fault earthquake resilience programme)
AI	Artificial Intelligence
CCC	Climate Change Commission
CIGIDEN	Chilean Research Centre for Integrated Disaster Risk Management
CRI	Chilean Research Centre for Integrated Disaster Risk Management
DEVORA	Determining Volcanic Risk in Auckland
DIA	Department of Internal Affairs
DOI	Digital Object Identifier
DPMC	Department of Prime Minister and Cabinet
EAG	Establishment Advisory Group
ECR	Early Career Researcher
EOI	Expression of Interest
GNS	Institute of Geological and Nuclear Sciences
HRRA	Hazard and Resilience Research Alliances
IAG	Insurance Australia Group (insurance company)
ICNZ	Insurance Council of New Zealand
ICT	Information and Communications Technology
IP	Intellectual Property
ISP	International Science Panel
KPI	Key Performance Indicator
LGNZ	Local Government New Zealand
MBIE	Ministry for Business, Innovation & Employment
MfE	Ministry for the Environment
MPI	Ministry for Primary Industries
NEMA	National Emergency Management Agency
NHC	Natural Hazards Commission Toka Tū Ake
NHERI	Natural Hazards Engineering Research Infrastructure
NHRA	Natural Hazards Research Australia
NICF	National Iwi Chairs' Forum
NIWA	National Institute for Water and Atmospheric Research
NSC	National Science Challenge
NZGOAL	New Zealand Government Open Access and Licensing Framework
NZTA	New Zealand Transport Agency
PhD	Doctor of Philosophy

Acronyms	Description
PSG	Platform Steering Group
RAND	Research and Development (US-based think-tank)
RCET	Rapid Characterisation of Earthquakes and Tsunami (research programme)
ReCap	Recovery Capitals (research project)
RNC	Resilience to Nature's Challenges
RS&T	Research, Science & Technology
SSIF	Strategic Science Investment Fund
ToR	Terms of Reference
USGS	United States Geological Survey
VM	Vision Mātauranga
WREMO	Wellington Regional Emergency Management Office
XRB	External Reporting Board

