

Programme	Contact Person	Description
Rural: Resilient Rural Backbone	Tom Wilson Thomas.wilson@canterbury.ac.nz	<p>The Rural Co-Creation Laboratory will broker innovative solutions for enhancing the resilience of rural New Zealand, recognising its unique contribution to our national identity and its pivotal economic function. A resilient rural backbone will be built via:</p> <ul style="list-style-type: none"> • Developing an integrated framework for assessing resilience to natural hazards across rural value chains: from households to regions and small to global-scale agribusinesses; • Producing tools for resilience-interventions and defining opportunities, through comprehensive scenario activities with key sectors, communities and regions; and • Building a researcher-stakeholder co-creation team and outreach network as 'honest brokers' for policy and practice leadership via new networks and through chains of land care, disaster management and other farming, tourism and rural community initiatives. <p>These outcomes will fast-track resilient solutions for multiple hazards into the New Zealand rural context.</p>
Urban: Resilient Cities	Suzanne.wilkinson@auckland.ac.nz	<p>The Urban Co-Creation Laboratory will integrate, implement and build onto the knowledge and tools created in the Resilience Toolboxes to enable cities in New Zealand to adapt and transform with urban change whilst building their resilience to natural hazards. Resilient cities will be built via:</p> <ul style="list-style-type: none"> • Developing a framework for evaluating city resilience to natural hazards in the New Zealand context and building an inter-city expertise collaborative network to advance implementation of resilience tools and measures; and <p>Working with the case study of Auckland City to develop an operating Resilient Cities model, focussing particularly on the issues of building resilience to nature's challenges into the rapid growth-plans and growth pains of the city, including major nationally significant investments in transport and housing.</p>
Edge: Living at the Edge - Transforming the Margins	Paul kench & Emma Ryan p.kench@auckland.ac.nz e.ryan@auckland.ac.nz	<p>Communities living on 'The Edge' are located in dynamic physical settings (e.g. coastal margins, flood plains), which are highly vulnerable to natural hazards. The experience of these hazards is exacerbated by climate, socio-economic and demographic change. New Zealand is characterised by many of these communities, facing intensification and acceleration of risk in response to natural hazards and experiencing an amplification of conflicts over how to adapt to changing environments.</p>

		<p>This priority co-creation laboratory programme will initially be developed in Hawke’s Bay, one of New Zealand’s “hot spots” of community conflict around coastal hazard management. It will lead to tangible, viable and acceptable solutions to support communities living in highly vulnerable settings. A participatory approach underpins the programme with the aim to develop pathways that enable communities to meaningfully engage, understand and contribute to the resolution of intense conflicts in high-risk locations, especially those exacerbated by changing climate, environment, socio-economic and land-development scenarios. The project will explore the policy, governance and community transitions required to adapt to current and future hazards. The solutions created will empower New Zealand communities to be risk-aware, agile participants in decision-making and developing resilient futures. Stakeholders will produce a shared understanding and a set of strategies to build resilience that are integrated with planning processes and support integrated governance systems at multiple scales.</p>
<p>Mātauranga Māori: Better understanding and implementation of Mātauranga Māori and tikanga to build resilience</p>	<p>Jon Procter j.n.procter@massey.ac.nz</p>	<p>We will integrate local/traditional/Iwi knowledge and integrate new Te Reo and Māori values into improved natural hazard resilience strategies for all New Zealand communities. This Co-creation Laboratory will also provide a basis for Māori researchers to explore Mātauranga Māori, Māori innovation and creativity and explore more meaningful ways to communicate resilient solutions to Māori and New Zealand. This research will produce new hazard and environmental management tools and Iwi development strategies that are rooted in long-lived successful traditional planning techniques that have survived through the ages in the face of New Zealand’s natural hazards, in some cases for over 700 years of human occupation. This pool of resources and Māori researchers will also guide other researchers to fulfil Vision Mātauranga (VM) principles and outcomes within the other strands of research within the Resilience Challenge.</p>
<p>Governance: Resilient governance for New Zealand’s future</p>	<p>Vivienne.ivory@opus.co.nz</p>	<p>This Programme addresses the role played by governance, policies, and institutional relationships that underpin an enduring resilience of communities to natural hazards. Research-based governance initiatives will build inter-generational mechanisms and practices of governance to face disruptive hazard shocks including those that vary with global change and climate change. Outcomes of this Programme will enable:</p> <ul style="list-style-type: none"> • Community and organisational adaptability to local and emerging needs (including for an uncertain future with a range in possible hazard and risk). • Negotiated, actionable response by public and private sector agencies and communities to both predictable and

		<p>unpredictable futures.</p> <p>New institutional frameworks where resilience is a key factor considered in decision-making in a way that incorporates the dynamic and changing nature of multiple hazards and risks as well as social and demographic shifts in New Zealand society.</p>
<p>Infrastructure: Infrastructure and built-environment solutions</p>	<p>Liam.wotherspoon@auckland.ac.nz Also Brendon Bradley @ canterbury</p>	<p>This Infrastructure toolbox aims to develop an improved understanding of the resilience of spatially-distributed infrastructure networks to natural hazards through development of new methodologies fitted to NZ-specific infrastructure. We will develop an "infrastructure resilience rating" for various systems, that can be used to fine-tune and improve the resilience to natural hazards of the infrastructure serving a community. This system will be used to drive public policy in infrastructure investment and provide asset owners with knowledge of externalities when investing in building resilience.</p>
<p>Economics: Creating an Economically Resilient New Zealand (CERNZ)</p>	<p>Garry McDonald Garry@me.co.nz</p>	<p>This toolbox aims to provide economic decision-support tools that enable New Zealand to more effectively and quickly transition to a nation resilient to natural hazards. These toolsets, which will be operate at multiple scales and for multiple stakeholders will:</p> <ol style="list-style-type: none"> 1. offer capabilities to simulate economy-wide consequences of infrastructure (horizontal and vertical) failure with and without alternative mitigations/adaptations; 2. extend widely-practiced approaches/conventions to economic decision/policy analysis (benefit-cost analysis) to allow for better appraisal of alternative resilient-building strategies; and <p>identify a set of best-practice risk-sharing and financial interventions to motivate resilience.</p>
<p>Culture: Cultural Resilience</p>	<p>Julia Becker j.becker@gns.cri.nz</p>	<p>The Cultural Toolbox research will investigate three priority research areas focussed on understanding, harnessing and building social norms that underpin a resilient culture in New Zealand. Integral to this research will be an outcome-focussed plan to clearly define the best tools and strategies to facilitate resilience becoming an integral "part of what we do and who we are". Diverse research methods will include a co-creation approach to build trust and respect-based relationships with key stakeholders/users from the outset. We will investigate new and rapidly evolving technologies, and the ways these can be harnessed to develop social norms of resilience across diverse communities and hazard profiles. We will engage with citizens to build their desire for involvement in hazard-related science, and develop a framework for citizen-science initiatives.</p>
<p>Hazard: Resilience to NZ's hazard</p>	<p>Mark Bebbington m.bebbington@massey.ac.nz</p>	<p>This Toolbox Programme will generate (involving closely integrated teams of community members/ representatives, officials, and scientists) new hazard</p>

spectrum		<p>knowledge, and a set of fit-for-purpose hazard tools and solutions that meet community and stakeholder aspirations for nationally consistent delivery of risk information that underpin development of resilience solutions across all relevant natural hazard types.</p> <p>Specifically, this Programme will develop new frameworks and methods to consistently express all parts of the hazard spectrum, from low-magnitude/high-frequency to high-magnitude/low-frequency cases. This will be incorporated with hazard and resilience-relevant knowledge among a wide range of community groups, governance and private agencies and other science stakeholders. This toolbox will further take into account the dynamic shifts that may occur along the hazards impact spectrum, due to factors including: climate change, societal change, and geological activity.</p> <p>This Programme will provide the Resilience Challenge with accurate and useable information by developing (i) a better understanding of how co-creation will aid in exchanging hazard and impact knowledge between scientists and end users; and (ii) a better understanding of the 'what' and 'when' of natural hazards in a variety of contexts, including cumulative, cascading and unexpected hazards.</p>
Trajectories: Resilience Trajectories for a Future Proof New Zealand	John.vargo@resorgs.org.nz	<p>Through a process of co-creation with end-users and stakeholders we will produce and test:</p> <ul style="list-style-type: none"> • a heuristic approach to measuring progress to resilience and projecting resilience pathways; • a resilience information utility that aggregates, organises, and facilitates sharing of pertinent data to support a range of evidence based solutions for resilience in New Zealand; • a prototype "Resilience Warrant of Fitness" system; • an expandable suite of resilience indicators that measure "all of community" resilience via a multi-capital model; <p>This work will lead to a robust means to monitor the impact of the Resilience Challenge and its progress toward reaching the Resilient New Zealand vision via a set of co-developed targets.</p> <p>A multi-capital model will ultimately be co-created between all work-streams of the Resilience Challenge together with Treasury's Living Standards Framework team, MCDEM and other key players in NZ.</p>