Te Hiranga Rū | QuakeCoRE

Aotearoa New Zealand Centre for Earthquake Resilience

2023 Annual Meeting Programme

Ahuriri | Napier

29 - 31 August

Key Information

Wifi login:

Network: Napier Conference and Events
No password required (just click through to terms and conditions)

Pigeonhole

Join the Session Q & A through the Pigeonhole website: **www.pigeonhole.at**
Passcode: QUAKECORE2023

For more information

Visit the Annual Meeting section of our website: **www.quakecore.nz/annualmeeting**

Table of Contents

Annual Meeting Programme

Tuesday 29 August	
5:00pm	Mihi Whakatau
6:00 - 7:00pm	Distinguished Lecture • Jack Baker: Engineering models to support regional disaster resilience assessment
7:00pm	Welcome Dinner

Wednesday 30 August	
8:00 - 9:00am	Registration & Poster Hanging
9:00 - 10:30am	Opening Session • State of QuakeCoRE • Lightning Talks (QuakeCoRE Student Chapters)
10:30 - 11:15am	Morning Tea
11:15am - 12:45pm	Plenary Session • Lifting. Shifting. Transforming? Cyclone Gabrielle's lessons for Aotearoa New Zealand's disaster resilience
12:45 - 1:45pm	Lunch
1:45 - 3:15pm	Plenary Session • Seeing Red: How can we bring our earthquake-prone buildings up to scratch?
3:15 - 3:30pm	Poster Showcase Session 1
3:30 - 4:30pm	Poster Session Afternoon Tea
6:30pm	QuakeCoRE Community Dinner

Thursday 31 August	
9:00 - 10:30am	Plenary Session • Consideration and mitigation of surface fault rupture hazards in earthquake resilience
10:30 - 11:00am	Morning Tea
11:00 - 11:45am	Panel Discussion • International perspectives and future predictions for earthquake resilience
11:45am - 12:00pm	Poster Showcase Session 2
12:00 - 12:45pm	Poster Session
12:45 -1:30pm	Lunch
1:30 - 3:00pm	Plenary Session • Greening seismic resilience
3:00 - 3:15pm	Closing Session • Directors Closing Remarks & Awards • Poroporoaki

About Us

Te Hiranga Rū QuakeCoRE is transforming the earthquake resilience of communities and societies, through innovative world-class research, human capability development and deep national and international collaborations. As a Centre of Research Excellence (CoRE) funded by the New Zealand Tertiary Education Commission (TEC), QuakeCoRE is a national network of leading Aotearoa New Zealand earthquake resilience researchers. QuakeCoRE is hosted by the University of Canterbury and has twelve formal partners.

We enhance earthquake resilience across the country and internationally, by working collaboratively on integrated, multi-disciplinary programmes of world-leading research. Our research supports the development of an earthquake-resilient Aotearoa New Zealand.

Our vision

We will create an earthquake-resilient Aotearoa New Zealand where thriving communities have the capacity to recover rapidly after major earthquakes through mitigation and pre-disaster preparation informed by research excellence.

Partners

UC University of Canterbury Te Whare Wānanga o Waitaha Christchurch New Zealand

The University of Auckland Te Whare Wānanga o Tāmaki Makaurau New Zealand

AUT

BRANZ

GNS Science Te Pū Ao

Lincoln University Te Whare Wānaka o Aoraki

m.e research

University of Otago Te Whare Wānanga o Otāgo New Zealand

Te Kunenga ki Pūrehuroa Massey University University of New Zealand

Resilient Organisations

Te Whare Wānanga o te Ūpoko o te Ika a Māui Victoria University of Wellington

The University of Waikato Te Whare Wānanga o Waikato

Our Outcomes

1 Improved earthquake resilience

We will contribute to a step-change improvement in the earthquake resilience of the nation's infrastructure from research-informed national and local policies, implementation standards and disaster planning.

2 Improved economic and commercial outcomes

We will support Aotearoa New Zealand's long-term economic benefit through significantly improved seismic performance of infrastructure, rapid business recovery after future earthquakes and the growth of engineering resilience innovation and business in the construction sector driving international competitiveness.

3 Improved societal outcomes

We will enable communities to recover rapidly after major earthquakes through mitigation and pre-disaster preparation, informed by research and public engagement.

4 Growing Mātauranga Māori

We will contribute by building close engagement with Māori leaders who have responsibility for earthquake planning and resilience and developing opportunities for Māori capability building. The distinctive contribution of Māori indigenous knowledge of earthquake resilience will enhance social, economic and environmental outcomes for Aotearoa New Zealand.

5 Public policy and services

Our collaborations with end-users will result in significant improvements to the government's disaster planning and infrastructure development policies. We will provide research evidence that will directly inform national and local policies relating to earthquake resilience to benefit communities across Aotearoa New Zealand.

6 Health outcomes

Our research will significantly reduce injury, loss of life and the subsequent economic impacts through the identification and mitigation of life-safety risks in existing buildings. We will ensure major social and wellbeing-related impacts, including long-term psychological impacts, are lessened due to reduced infrastructure damage, casualties and economic disruption allowing faster recovery and better outcomes for all New Zealanders.

7 Environmental outcomes

We will improve the built and natural environments through our enhanced understanding of seismic geohazards and infrastructure performance. Focus on low-damage solutions and novel cost-effective technologies will significantly reduce the carbon footprint of the construction sector.

8 Highly skilled and diverse workforce

Our graduates will be sought after for their knowledge of earthquake resilience and work-ready professional skills. They are taught in the very best national and international multi-disciplinary environments, combining research and industry elements. Through our graduates, we will seek a growth in under-represented groups (Māori and Pasifika) and gender equality in engineering disciplines.

9 International recognition

We will be a focal point for international earthquake resilience, attracting the best talent and business alongside national and international research collaborations.

Our Leadership

Governance Board

Mike Mendonça – Chair

Richard Clarke
University of Auckland

Dave Brunsdon
Kestrel Group

Ellen Rathje
University of Texas at Austin

Wendy Saunders
Toka Tū Ake EQC

Tā Mark Solomon

Ian Wright
University of Canterbury

Leadership

Brendon Bradley – Director
University of Canterbury

David Johnston – Deputy Director
Massey University

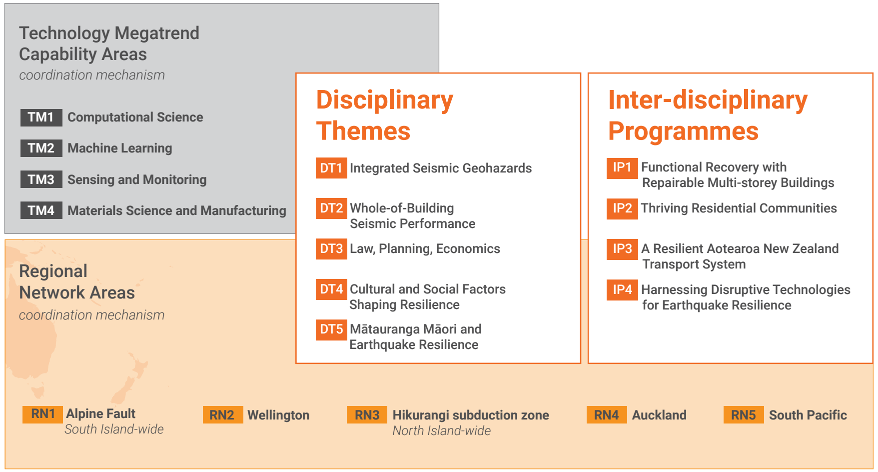
Caroline Orchiston – Associate Director
University of Otago

Liam Wotherspoon – Associate Director
University of Auckland

Kelvin Tapuke - Pouwhakahaere
(Te Atiawa, Ngāti Tama, Ngāti Mutunga, Ngāi Tai, Ngāi Tai ki Tāmaki, Ngāti Porou, Te Whānaua ā- Apanui, Te Aitanga a- Māhaki, Ngāi Tūhoe, Te Whakatōhea, Ngāi Tahu, Ngāti Maniapoto, Ngāti Raukawa, Toa Rangatira)
Massey University

Research Programme

Te Hiranga Rū QuakeCoRE aims to establish and link multi-institutional national research programmes that are internationally networked. The research programmes are advancing the science and implementation pathways of earthquake resilience through system-level science with highly integrated collaborations coordinated across the physical, engineering and social sciences and relevant research institutions.



Research Areas

Disciplinary Themes (DTs)

DT1 Integrated Seismic Geohazards
Brendon Bradley
Rolando Orense
Tim Stahl

DT2 Whole-of-Building Seismic Performance
Rick Henry
Santiago Pujol

DT3 Law, Planning and Economics
Ilan Noy
John Hopkins
Olga Filippova

DT4 Critical Social and Cultural Factors Shaping Resilience
David Johnston
Caroline Orchiston

DT5 Mātauranga Māori and Earthquake Resilience
Anthony Hoete
Christine Kenney
Tūmanako Fa'aui

Inter-disciplinary Programmes (IPs)

IP1 Functional Recovery with Repairable Multi-Storey Buildings
Geoff Rodgers
Alice Chang-Richards

IP2 Thriving Residential Communities
Tim Sullivan
Julia Becker

IP3 A Resilient Aotearoa New Zealand Transport System
Liam Wotherspoon
Charlotte Brown

IP4 Harnessing Disruptive Technologies for Earthquake Resilience
Nirmal Nair
Garry McDonald

Distinguished Lecture

Engineering models to support regional disaster resilience assessment

Tuesday 29 August 2023 - 6:00 –7:00pm

Chair: Brendon Bradley

Speaker: Jack Baker
Professor, Stanford University,
United States of America

Distinguished Lecture

Abstract:

Achieving disaster resilience requires insights and contributions from earth scientists, engineers, and social scientists. This talk will highlight recent engineering developments from the Stanford Urban Resilience Initiative. Several new computational workflows and assessment tools allow for the quantification of a broader range of disaster impact metrics, and facilitate the comparison of physical and policy interventions to mitigate risks. First, performance-based assessment methodologies are extended to allow for high-resolution simulation of restoring a damaged building to functional operation. Second, regional computational workflows provide easier access to data and calculation procedures for community impact assessment. Third, physical damage simulations are coupled with agent-based models, to account for the effects of household preferences and demographics on the recovery process. Collectively, these developments provide new insights for risk reduction, and allow the engineering community to engage with and benefit from social sciences scholarship.

Biography:

Jack Baker is a Professor of Civil & Environmental Engineering and Associate Dean for Faculty Affairs in the Stanford Doerr School of Sustainability. He uses probabilistic and statistical tools to quantify and manage disaster risk and resilience. He has made contributions to risk analysis of spatially distributed systems, characterization of earthquake ground motions, and simulation of post-disaster recovery. He is an author of the textbook Seismic Hazard and Risk Analysis, Director of the Stanford Urban Resilience Initiative, Editor-in-Chief of Earthquake Spectra, and a Co-Founder of Haselton Baker Risk Group. His awards include the William B. Joyner Lecture Award from the Seismological Society of America and Earthquake Engineering Research Institute, the Walter L. Huber Prize from the American Society of Civil Engineers, and the Early Achievement Research Award from the International Association for Structural Safety and Reliability.

Plenary

Lifting. Shifting. Transforming? Cyclone Gabrielle's lessons for Aotearoa New Zealand's disaster resilience

Wednesday 30 August 2022 - 11:15am - 12:45pm

Chair: Liam Wotherspoon

Speakers: Tom Wilson
Anna Madarasz-Smith
Chad Tareha

Cyclone Gabrielle has highlighted both the vulnerability of society to extreme events and the resilience of our communities. It has also brought into focus the state of semi-continuous response and recovery of many communities, infrastructure networks and emergency management systems. This has shifted capacity away from both regional and national long-term risk reduction planning and thinking. This session will explore some of the key issues stemming from the response and recovery to Cyclone Gabrielle. This will include key lessons learned that are being used to inform the recovery of affected regions and future resilience efforts. Local, regional and national perspectives will be presented, with a focus on Hawkes Bay and Tairāwhiti. The evolving lessons from this event in terms of impacts in urban and rural areas, as well as to critical infrastructure, will provide insights into what we can expect from future earthquakes and other natural hazard events in this region. These lessons can also be transferred to other locations across the country.

Photo credit: The view of State Highway 2 between Napier and Wairoa from a NH90 helicopter. New Zealand Defence Force (CC BY 4.0)

Plenary

Seeing red:
How can we bring our earthquake-prone buildings up to scratch?

Wednesday 30 August 2023 - 1:45pm - 3:15pm

Chair: Olga Filippova

Speakers: Alistair Cattanach
Glen Hazelton
Dean Whiting

New earthquake-prone building (EPB) legislation that came into effect in 2017 meant that the riskiest buildings in high and medium-risk areas must be strengthened in half the time because of their location and type of construction. EPBs are 10-25 times more likely to collapse in an earthquake. Although many building owners successfully strengthened their buildings, there is still much to do with hundreds of EPB notices expiring this decade. Experience of similar policies in response to the Kaikōura Earthquake showed that most owners tend to leave remediation to the last minute. These impending deadlines will inevitably put financial pressure on building owners and strain the professional and construction industry. While local councils lack the levers to order strengthening before the legally allowed timeframe, how can we improve our seismically vulnerable stock while balancing life safety and costs? In this session, we will discuss the retrofit decision-making process, the influence of Mātauranga Māori on policy design and its contribution to resilient building practices, and the role of urban regeneration in enhancing seismic resilience. The panel discussion will examine the challenges and opportunities as we continue to improve the resilience of our most vulnerable buildings.

Unreinforced Masonry Retrofit – Are we becoming a two-tier society?

Alistair Cattanach *(Dunning Thornton Consultants)*

Biography

Alistair is a Director of Dunning Thornton, Wellington with over 28 years' experience consulting in Aotearoa New Zealand and the United Kingdom. His interest in heritage buildings features throughout his career, with masonry projects of note including the Odlins/NZX Centre, Sheds 11 and 13, Mt Victoria Chest Hospital/SPCA, the Woolstore and the Old Public Trust, all in Wellington, and the Nelson School of Music. He has an interest in using simple techniques executed elegantly, and believes strengthening masonry buildings is a key role for engineers in the sustainable use of our building stock. Alistair was a co-author of the New Zealand Society for Earthquake Engineering (NZSEE) Guidelines Masonry Chapter.

Abstract

Recent experience of seismic retrofit shows a lessening interest from the public as earthquakes become a distant memory. Although earthquake-prone building (EPB) notice deadlines are rapidly approaching, the projects we are seeing progress are typically publicly or benefactor funded and strengthened to a high level. How do we encourage uptake from "average" building owners, even to a lower level of seismic resistance?

This presentation discusses a current proposal with the Ministry for Business, Innovation and Employment (MBIE) for a simple strengthening process, intending to cut costs and streamline compliance. This will be contrasted with some aspects of current complex heritage retrofit projects.

Exploring collaborative approaches to encouraging seismic upgrades

Glen Hazelton *(Dunedin City Council)*

Biography

Glen led the heritage program at Dunedin City Council between 2009 and 2016 and led the Warehouse Precinct Revitalisation Plan, transforming a derelict area into one of the city's most exciting heritage areas. During this time he also co-wrote the city's second earthquake-prone buildings policy and developed numerous incentives to encourage seismic upgrade in historic buildings.

After time in Perth and Wellington, during which time he developed the Saving the Town publication, Glen returned to Dunedin in 2021 as Project Director Central City Plan. He is currently overseeing a significant upgrade of infrastructure in the CBD. Glen has specific interests in collaborative, holistic approaches and incentivisation of the private sector to work collaboratively to develop positive heritage, seismic and urban regeneration outcomes.

Abstract

The challenges facing building owners to achieve seismic upgrades are widely understood and discussed at length in the media. The focus on these challenges can make the task seem insurmountable. However, across the country there are success stories emerging that demonstrate even in challenging economic circumstances success is possible. Of key interest is the potential offered by more collaborative approaches to seismic upgrade, where a more holistic approach to building and neighbourhood upgrades is taken. As well as examining successful case studies around Aotearoa New Zealand and the approaches being taken, the presentation examines how some of the more comprehensive approaches taken to urban regeneration could be used to create conditions more amenable to financially-viable seismic upgrade.

Mātauranga Māori: Preserving the legacy of Māori building innovation

Dean Whiting *(Heritage NZ Pouhere Taonga)*

Biography

Dean Whiting is Deputy Chief Executive for Māori Heritage at Heritage NZ Pouhere Taonga and specialises in the conservation of marae heritage buildings assisting communities through the Māori built heritage programme. With a degree in the Conservation Cultural Materials, he has an interest in not only the physical preservation of place, but the relationship and revitalisation of Mātauranga Māori for Māori communities.

Abstract

Māori built heritage such as wharenui, pātaka, kāuta and other traditional building types are an extraordinary legacy of innovation derived from ocean voyaging waka technology to the rise of large pā complexes and wharewhakairo. Our collective view has been to consign these places to the past, not necessary the cultural importance or historical narrative, but more so Mātauranga that was embodied to create them. The overwhelming dominance of western knowledge and societal constructs soon marginalises indigenous systems of knowledge and as such we lose an important contributor to our knowledge of how to live within the bounds of this land. The challenge is to look to the value and opportunity of this Mātauranga, but equally preserve and celebrate the examples for those communities to that they belong.

Plenary

Consideration and mitigation of surface fault rupture hazards in earthquake resilience

Thursday 31 August 2023 - 9:00 - 10:30am

Chair: Dave Brunsdon

Speakers: Tim Stahl
Wendy Saunders

Large shallow earthquakes can result in fault surface displacements of several meters laterally and vertically, imposing extreme demands on any intersecting structures and infrastructure. The permanent displacements can also result in drastic changes to the path of rivers and the relative elevation of urban areas in coastal settings, causing major vulnerabilities to other natural hazards. Despite the number of significant seismic events in Aotearoa New Zealand over the past 15 years, surface fault rupture has not caused major consequences for urban regions; whereas we know that regions, like urban Wellington, are criss-crossed by the surface expressions of major faults. This session will focus on examining our current understanding of the science of surface rupture, how engineered structures are (or are not) designed to be able to withstand the consequent demands they impose, and planning and policy tools and regulations that enable or impede the process.

Fault Displacement Hazards – Current practice and the case for a 'multi-hazards' approach

Tim Stahl *(University of Canterbury)*

Biography

Tim Stahl is an earthquake geologist and Senior Lecturer in Tectonics at the University of Canterbury (UC). Following PhD work at UC on the 2010 Darfield Earthquake and reverse faults in Aotearoa New Zealand's South Island, Tim received a National Science Foundation Postdoctoral Fellowship (University of Michigan), during which he studied active tectonics of the eastern Basin and Range (USA) and the Greater Caucasus of Georgia. His Aotearoa New Zealand Toka Tū Ake EQC & Ministry of Business Innovation and Employment funded research group focuses on geological characterisation and modelling of earthquake multi-hazards – fault displacement, landslides, and coseismic floods. Tim is currently serving as Associate Editor of Seismological Research Letters.

Abstract

The risks posed by surface fault rupture to buildings and infrastructure have been recognised for decades, but Fault Displacement Hazard Analysis (FDHA) remains a relatively new field. Additionally, other earthquake hazards often spatially coincide with zones of permanent, coseismic ground deformation near surface rupturing faults. What are the best ways to characterise and quantify these hazards on site-specific and regional scales? This talk covers a basic history of FDHA in Aotearoa New Zealand and overseas, as well as lays out the importance of a multi-hazard approach. In particular, recent research has highlighted that coseismic landslides and flooding may be caused or exacerbated by fault displacements. The results of these studies demonstrate linkages between traditional seismic source characterization and multi-hazard models, that combined, reduce the consequences earthquakes on people and property.

When faults move: Issues, challenges, and the future of land use planning for active faults

Wendy Saunders *(Toka Tū Ake EQC)*

Biography

Dr Wendy Saunders is the Champion of Land Use Planning in the Risk and Resilience team at Toka Tū Ake EQC. Wendy's role includes implementing the Smarter Land Use Action Plan for Risk Reduction, through advancing planning policy through the reforms of the Resource Management Act; working with the New Zealand Planning Institute to build capability and capacity in natural hazards planning and decision making; and submitting on national and district policies to improve planing practice. Wendy has over 20 years experience in research, policy development, and practice of natural hazards planning.

Abstract

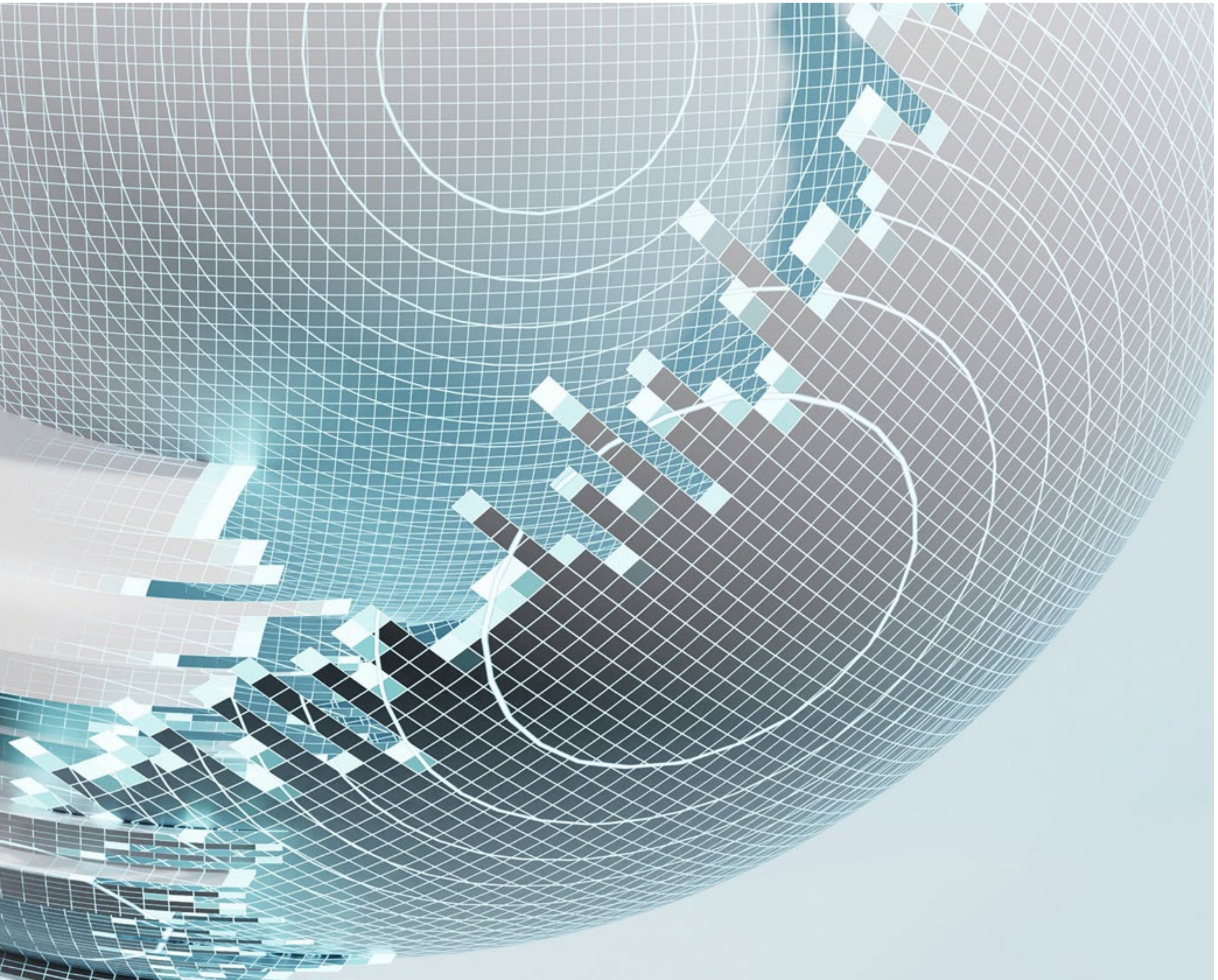
Across the motu (country), faults move – not just tectonically, but also on regulatory planning maps.
For many councils across the country, a challenge arises when receiving updated fault information that shows a fault has 'moved' from one location on a district plan map, to another, perhaps 20m away. What happens to the prior fault avoidance zone, and what happens to those houses now in the avoidance zone? Whose responsibility is it?

To assist councils in planning for active faults, guidance has been available since 2003. The guidelines are in urgent need of being updated, as technical advances have been made during this time in locating faults, and we have recent experiences of what happens when faults tectonically move. We also have an increased demand for housing supply, and continue to consent and build in fault areas using old information, creating legacy issues. This presentation will discuss the future for the guidelines, and how we need to change how we plan for active faults.

Panel Discussion

International perspectives and future predictions for earthquake resilience

Thursday 31 August 2023 - 11:00 - 11:45am



Chair:	Brendon Bradley
Speakers:	Jack Baker Ann Bostrom Shyh-Jiann Hwang Ellen Rathje

Te Hiranga Rū QuakeCoRE is a national research centre with deep international collaborations. This moderated panel discussion takes advantage of the physical presence of four members of the CoRE's International Science Advisory Board to contemplate future trends and opportunities in earthquake resilience globally; and an international perspective as to how researchers in Te Hiranga Rū QuakeCoRE, and the CoRE itself, can be well positioned to make an impact.

Jack Baker *(Stanford University)*

Biography

Jack is a Professor of Civil & Environmental Engineering and Associate Dean for Faculty Affairs in the Stanford Doerr School of Sustainability. He uses probabilistic and statistical tools to quantify and manage disaster risk and resilience. He has made contributions to risk analysis of spatially distributed systems, characterisation of earthquake ground motions, and simulation of post-disaster recovery. He is an author of the textbook Seismic Hazard and Risk Analysis, Director of the Stanford Urban Resilience Initiative, Editor-in-Chief of Earthquake Spectra, and a Co-Founder of Haselton Baker Risk Group.

Ann Bostrom *(University of Washington)*

Biography

Ann is the Weyerhaeuser Endowed Professor of Environmental Policy at the Evans School of Public Policy and Governance at the University of Washington. Her research focuses on risk perception, communication, and management; and environmental policy and decision making under uncertainty. Ann is the co-PI on the National Science Fund (NSF) funded Cascadia Coastlines and Peoples Hazards Research Hub, and co-leads the risk communication research in the NSF AI Institute for Research on Trustworthy AI in Weather, Climate, and Coastal Oceanography (AI2ES).

Shyh-Jiann Hwang *(National Taiwan University)*

Biography

Shyh-Jiann is a Professor of Civil Engineering at the National Taiwan University, Taipei, Taiwan. He also serves as the Director of National Center for Research on Earthquake Engineering (NCREE) in Taiwan and has been awarded the Distinguished Chair Professor of National Taiwan University. His research interests include shear behaviour of reinforced concrete members, and seismic design and retrofitting of reinforced concrete structures. He serves as a member of the seismic code committee in Taiwan and has provided technical support to a national project that evaluates and retrofits all the non-code compliant school buildings in Taiwan as well as leading a seismic retrofitting project which aims to remove critical seismic deficiencies from residential buildings.

Ellen Rathje *(University of Texas at Austin)*

Biography

Ellen is the Janet S. Cockrell Centennial Chair in Engineering in the Department of Civil, Architectural, and Environmental Engineering at the University of Texas at Austin (UT), and Senior Research Scientist at the UT Bureau of Economic Geology. Ellen is the Principal Investigator for DesignSafe, the cyberinfrastructure component of the National Science Foundation (NSF) funded Natural Hazards Engineering Research Infrastructure (NHERI) programme which focuses on cloud strategy for the big data generated by national hazards engineering research. She is a founding member and current Steering Committee member of the Geotechnical Extreme Events Reconnaissance (GEER) Association. Ellen's research focuses on seismic site response analysis, earthquake ground motion characterisation, field reconnaissance after earthquakes and remote sensing.

Plenary

Greening seismic resilience

Thursday 31 August 2023 - 1:30 - 3:00pm

Chair:	David Carradine
Speakers:	Charlotte Toma Max Stephens Allan Scott Tom Logan

One of the greatest challenges facing the built environment is balancing seismically resilient performance objectives with reduced greenhouse gas emissions over the life of the building. As we address future earthquake resilience challenges, we need to explore ways of contributing towards a net-zero carbon Aotearoa New Zealand in a systemic manner. This highlights the importance of timeliness in research on the environmental impacts of design from building material selection and engineering solutions to sustainable urban planning in order to achieve community resilience.

This session includes short presentations followed by a panel discussion from four speakers that represent sustainability and resilience researchers. The purpose of this session is to discuss how to find that 'sweet spot' for achieving a balancing act between sustainability and seismic resilience from material, engineering design and urban systemic perspectives. A facilitated panel discussion will delve into the challenges and opportunities ahead as we continue to build climate-adaptive and seismically resilient communities.

Getting earthquake engineers onboard with low carbon

Charlotte Toma & Max Stephens *(University of Auckland)*

Biography

Charlotte is a senior lecturer in the Structures Group at the University of Auckland. Her research interests include sustainable design, design for natural hazards and beyond code seismic resilience. Across her roles at the University, as lead of the Developing Leading Women Programme and within Structural Engineering Society New Zealand (SESOC) she is motivated by driving change and growth within the structural industry.

Max Stephens is a senior lecturer in structural engineering at the University of Auckland. His research is focused on improving the resiliency of the built environment to natural hazards with an emphasis on linking sustainable and resilient design.

Abstract

As Aotearoa New Zealand begins to grapple with the issue of shifting to a low carbon economy, it is increasingly important that our buildings are not only seismically resilient, but also positively contribute to the transition to a net-zero carbon economy. Through case study analysis of both commercial and multi-unit residential type buildings we are exploring how the seismic performance objectives impact the upfront embodied carbon at construction, and the environmental impact over the life of the building through risk-based lifecycle cost-benefit analysis. The intent is that through understanding the links between these two key concepts, we can outline 'drivers for change' of carbon reduction and seismic resilience.

Low carbon materials for reinforced concrete construction

Allan Scott *(University of Canterbury)*

Biography

Allan Scott is an Associate Professor of Civil Engineering at the University of Canterbury. His primary research interests include the development of sustainable low carbon construction materials and in situ resource utilization options for off-earth civil engineering construction applications.

Abstract

Concrete is the most versatile and widely consumed material on the plant, second only to water. While there are many advantages associated with the use of concrete in construction, traditional Portland cement as a binder is responsible for approximately 8% of global CO_2 emissions.

There are a number of potential options to help reduce carbon emissions associated with concrete construction. Traditional supplementary cementitious materials, new pozzolanic materials, alternative binder systems and carbon capture can dramatically reduce the amount of CO_2 associated with concrete utilisation.

Leveraging co-benefits from resilience at the community level

Tom Logan *(University of Canterbury)*

Biography

Tom Logan is a Lecturer in Civil Systems Engineering at the University of Canterbury and Technical Director for Urban Intelligence Ltd. His PhD from the University of Michigan focused on risk and resilience of communities.

Through his work, he looks to adapt our towns and cities to climate change and works to achieve this to enhance co-benefits and synergies to ensure our communities become more resilient, sustainable, healthy, and equitable.

Abstract

Enhancing community resilience at times requires substantial investment or urban changes. But these changes have, when thought out, the potential to have wide co-benefits for environmental justice, public health, and sustainability. Tom will describe ways of taking a systems-approach to thinking about community resilience and what the lessons and opportunities are for enhancing community well-being.

Lightning Talks

Kristian Azul
(University of Auckland)

Chanthujan Chandrakumar
(Massey University)

Felipe Kuncar
(University of Canterbury)

Melanie Roundill
(Victoria University of Wellington)

Karin Stahel
(University of Canterbury)

Ayushi Tiwari
(University of Canterbury)

Katharine Vincent
(University of Auckland)

Voting for the Lightning Talks Audience Choice Award

Voting will open at the end of the session and will close at 1pm on Thursday 31 August 2023.

To vote, visit: www.bit.ly/QCAM23LT
or scan this QR code to be taken to the website

The winner of the Audience Choice Award will be announced in the closing session on Thursday afternoon.

Posters

Disciplinary Theme 1
Integrated Seismic Geohazards

1 Assembling Liquefaction-related Data for the Development of Hybrid Liquefaction Prediction Model

Azul, K., Orense, R., Wotherspoon, L.

2 Cybershake NZ 2023 updates: New Zealand simulation-based probabilistic seismic hazard analysis

Bae, S., Ridden, J., Schill, C., Paterson, J., Bradley, B., Lee, R.

3 Hazard Sensitivities Associated with Ground-Motion Characterization Modelling for the New Zealand Seismic Hazard Model Revision 2022

Bora, S., Bradley, B., Manea, E., Gerstenberger, M., Lee, R., Stafford, P., Atkinson, G., Kaiser, A., DiCaprio, C., Van Dissen, R.

4 Particle crushing in pumiceous sands and silts during cyclic triaxial loading

Chaneva, J., Kluger, M., Moon, V., Lowe, D., Orense, R.

5 Comprehensive Seismic Damage Assessment in Gyeongju City: Integrating Local Seismic Environment with ERGO-EQ Platform

Chey, M., Jang, S., Mehta, V.

6 Fault Displacement hazard in a New Zealand context and implications this has towards the road network exposure.

Daglish, J., Stahl, T., Wotherspoon, L., Howell, A., Bloom, C.

7 How effective was sluicing as a rockfall remediation method following the 2016 Kaikōura earthquake?

Daysh, I.

8 Residual-Based Non-Ergodic Site-Response Adjustments to Empirical Ground-Motion Models to Account for Basin Effects in Wellington, New Zealand

de la Torre, C., Bradley, B., Lee, R., Tiwari, A., Wotherspoon, L., Ridden, J., Kaiser, A.

9 Exploring the 2022 Aotearoa New Zealand NSHM with Kororā, a Public Webapp

Dicaprio, C., Chamberlain, B., Chamberlain, C., Gerstenberger, M.

10 The 2022 Aotearoa New Zealand NSHM

Gerstenberger, M., Bora, S., Bradley, B., DiCaprio, C., Kaiser, A., Nicol, A., Stirling, M., Thingbaijam, K., Van Dissen, R., and the NSHM Team.

11 Modelling coseismic landslide impacts on infrastructure systems in Wellington

Harvey, J., Robinson, T.

12 Real-time correction of ground motion amplification for a rapid seismic intensity reporting system

Jeong, S., Kwak, D., Hwang, E.

13 Frequency-domain methods to account for shallow site effects in hybrid broadband ground-motion simulations

Kuncar, F., Bradley, B., de la Torre, C., Rodriguez-Marek, A., Zhu, C., Lee, R.

14 Comparison of seismic performance assessment using observed or simulated ground motions in seismic hazard analysis and ground motion selection

Loghman, V., Bradley, B., Lee, R., Schill, C., Chandramohan, R., McGann, C.

15 Lessons from the 2016 Kaikōura earthquake for the resilience of earthworks

Mason, D., Brabhaharan, P., Fenton, C.

16 Examining coseismic river response to surface-rupturing fault displacement

McEwan, E., Stahl, T., Howell, A., Langridge, R., Wilson, M.

17 Investigating the occurrence of Kaikōura-like ruptures in a multi-fault, multi-cycle earthquake simulator

Penney, C., Howell, A., McLennan, T., Nicol, A., Fry, B.

18 Post-Event Ground Motion Estimation Using Physics-Based Simulations

Schill, C., Bradley, B., Dempsey, D.

19 Investigating systematic site effects and within-site variability in New Zealand: A comprehensive residual analysis of empirical- and physics-based GMMs

Tiwari, A., de la Torre, C., Bradley, B., Lee, R.

20 Identifying internal instability type with soil microstructure

Vincent, K., Crawford-Flett, K., Wotherspoon, L.

21 Understanding Operational Vulnerabilities & Systemic Risk in Integrated Stopbank-Dam Catchments

Wallace, T.

22 Spectral Decomposition of Ground Motions in New Zealand using the Generalized Inversion Technique

Zhu, C., Bradley, B., Bora, S.

Disciplinary Theme 2
Whole-of-Building Seismic Performance

23 Seismic behaviour factors for rocking Cross-Laminated Timber walls with friction devices

Agarwal, S., Hashemi, A., Quenneville, P.

24 Medium Density Housing (MDH) – Preliminary Study to Develop Low-damage Solution for Low-rise Residential Building

Apriani, I.

25 Upcoming Large Scale Experimental Test of A Two-Storey Rocking Timber Wall Structure With Innovative Low-Damage Floor Connections

Assadi, S., Hashemi, A., Quenneville, P.

26 A Novel Inter-Story Isolation System for Cross-Laminated Timber (CLT) Platform Construction- Concept Development and Preliminary Evaluation

Lal, R., Hashemi, A., Quenneville, P.

27 Developing and Implementing Vulnerability Functions for Multi-Storey Residential Buildings in New Zealand

Lin, S., Moratalla, J., Uma, S., Lukovic, B.

28 Seismic Performance of Precast Prestressed Hollow-core Floors and Residual Capacity of Web-cracked Floor Units

Mostafa, M., Henry, R., Elwood, K.

29 What controls earthquake-induced building damage and what implications do they have for magnitude estimates of historical earthquakes?

O'Kane, A.

30 Seismic performance of recently-constructed concrete wall-steel frame hybrid buildings

Pascua, C., Henry, R., Toma, C., Clifton, C.

31 Three-storey Configurable Steel Framed Building Incorporating Friction Based Energy Dissipaters

Ramhormozian, S., Yan, Z., Clifton, C., Quenneville, P., MacRae, G., Dhakal, R., Xiang, P., Jia, L.

32 Repair of RC Concrete Columns with Post-tensioned Clamps

Rincon Gil, J., Pujol, S.

33 Experimental study on FRP ties used in precast diaphragm strengthening subjected to incompatible support beam rotation and parallel beam elongation

Salimian, M., del Rey Castillo, E., Hogan, L., Stephens, M.

34 Enhancing City Resilience: A Local Council's Approach in Managing Risk from Earthquake-Prone Buildings

Siddiqui, U.

35 Tsunami Loading on Buildings

Till, H., Stephens, M., Toma, C.

36 Effect of Dynamic Loading Rates on the Seismic Response of Lightly Reinforced Concrete Walls

Wang, Q., Henry, R.

37 Seismic strengthening of floor diaphragms with carbon fibre materials (CFRP)— FEM modelling

Yu, T., Enrique, D.

38 Optimizing the Design of EB-FRP for Tension Strengthening: Exploring the Impact of Diverse FRP Sheets and Anchor Configurations

Zhang, J., del Rey Castillo, E.

Disciplinary Theme 3
Law, Planning and Economics

39 How might green and blue infrastructure planning considerations inform the re-design of public open spaces for DRR?

Andige, N.

40 Community Resilient Landscapes: examining blue green networks as a catalyst for social resilience

Campbell, A.

41 A new direction: Opportunities for national direction on natural hazard management during RMA reform

Church, C., Orchiston, C., Saunders, W.

42 Parenting and Family Rights in the Midst of Earthquakes

Clausing, S.

43 Identifying and Navigating Roadcones on the long road to the establishment of the Canterbury Earthquake Insurance Tribunal

Collins, T.

44 More than just a civil defence hub: Ngāi Tahu involvement in the Canterbury Earthquake Recovery - a model

Evans, R.

45 Post-Earthquake Reconstruction of Christchurch City Center- Housing Challenges

Fatourehchishabestari, A., Filippova, O., Rehm, M.

46 Governing Disasters in Aotearoa New Zealand: An Auckland Volcanic Field Case Study

Faulkner, H.

47 Earthquakes, Emergency Responses Targeted at Business Recovery and Gender

Holman, B.

48 Seismic risk communication with commercial building tenants

Miranda, C., Brown, C., Becker, J., Hudson-Doyle, E.

49 Institutional structures, social capital and community disaster resilience: can legislative and governance arrangements facilitate community influence on disaster recovery decision making?

Sarwary, S.

50 A national risk tolerance assessment methodology

Saunders, W.

Disciplinary Theme 4
Critical Social and Cultural Factors Shaping Resilience

51 Earthquake-triggered rockfalls from coastal cliffs: can citizen science play a role?

Jaramillo-Velez, A., Tan, M., Prasanna, R., McColl, S., Stewart, C., de Vilder, S.

52 Enhancing earthquake and tsunami preparedness and response in Kura Kaupapa Māori/ Schools in Te Tairāwhiti and Waiāriki, Aotearoa New Zealand

Tapuke, K., Kaiser, L., Johnston, D., Becker, J., McCombe, G.

53 Perception, Experience and Resilience to Risks: A global analysis

Kieu, M., Senanayake, G.

54 Preparing for Impact: How is science communication helping us prepare for the next Alpine Fault Rupture?

Rowe, C.

55 QuakeBox Similes: Change and persistence in similes in post-earthquake narratives

Stahel, K.

Disciplinary Theme 5
Mātauranga Māori and Earthquake Resilience

56 Papa Wiri: Te Ao Māori Disaster Risk Reduction through Participatory Design and Co-Design of Educational tools

Alger, B., Thomas, K., Kaiser, L.

57 Understanding cascading climate change risks for Māori communities

Scadden, M.

58 Adaptation of Marae Infrastructure for Natural Hazards Resilience

Vercoe, H., Fa`aui, T., Wotherspoon, L.

Inter-disciplinary Programme 1
Functional Recovery with Repairable Multi-storey Buildings

59 Using tertiary building performance to define post-disaster functionality timeframes for community recovery and resilience

Mayer, B., **Boston, M.,** Chang-Richards, A.

60 A Comparative Study of New Zealand and Japanese Concrete Moment Frames Designed for Low Seismic Regions

Buck, N., Hogan, L., Stephens, M.

61 Resilient Buildings Project: Relating Societal Expectations to Performance Objectives for Buildings - the Earthquake Performance Outcome Framework

Ferner, H., Abeling, S., Beaven, S., Brown, C., Brunsdon, D., Cowan, H., Dunn, C., Elwood, K., Gill, D., Hare, J., Jury, R.

62 Multi-performance parametric framework to enhance the design process and implementation of low-damage timber buildings

Formichetti, G., Loporcaro, G., Pampanin, S.

63 Residual Capacity of Steel Reinforcement

Kuwabara, R., Hogan, L., Elwood, K., Opabola, E.

64 Analysis of quantitative methods for assessing functional recovery post earthquake

Li, L., Chang-Richards, A., Boston, M., Elwood, K.

65 Revolutionizing Post-Earthquake Inspections and Repairs: The Efficacy and Cost-Effectiveness of Using Structural Access Panels (SAPs) in Buildings

Luo, Z., MacRae, G.

66 User-focused Post-Earthquake Functional Recovery of Commercial Buildings in New Zealand

Nkrumah, S., Filippova, O., Ying, F.

Inter-disciplinary Programme 2
Thriving Residential Communities

67 Assessing the Flood Vulnerability of New Zealand's Earthquake-Prone Heritage Buildings Due to Climate Change Patterns

Ge, Y., **Aigwi, E.,** Nwadike, A.

68 Let's talk about risk: engaging communities in natural hazard and climate change conversations

Horsfall, S., Brown, C., Kilvington, M., Horn, C.

69 An Investigation of the Influence of the Reuse of Heritage Buildings on the Resilience of New Zealand Small Town Centres

Inal Kaynar, C., Isaacs, N., Brown, A., Noy, I.

70 Respiratory health impacts of natural hazard events in Aotearoa

Magill, C., Hales, S.

71 Infrastructure planning emergency levels of service for the Wellington Region

Mowll, R., Becker, J., Wotherspoon, L., Stewart, C., Johnston, D.

72 Tsunami Evacuation Behaviour: a review of survey findings across Aotearoa New Zealand

Prattley, L., Beaven, S., Wilson, T., Williams, J., Leonard, G.

73 The Role of Housing in Tertiary Students' Ability to Prepare for Earthquakes

Roundill, M.

74 Simulating household impacts for an Alpine Fault earthquake

Scheele, F., Wilson, T., Becker, J., Horspool, N., Campbell, M.

Inter-disciplinary Programme 3
A Resilient Aotearoa New Zealand Transport System

75 Functional Isolation: The compounding burden amidst cascading infrastructure network failures and disrupted supply chains

Anderson, M., Logan, T., Brunner, L.

76 A literature review of post-disaster road network performance assessment and management

Khadka, A., Costello, S., Ranjitkar, P.

77 Capturing the full complexity of post-disaster freight disruptions in New Zealand: an application of the Theory of Constraints

L'Hermitte, C., Trent, N., Qin, Y.

78 Rockfall risk and lifelines mitigation performance following the 2016 Kaikōura earthquake

Mabin, S.

79 Mitigating FMCG transport bottlenecks following an extended Cook Strait ferry outage in New Zealand

McDonald, N.

80 Prepositioning of relief items: A study of the factors influencing emergency management decisions

Shariati, A., L'Hermitte, C., Trent, N.

81 Exploring logistics behaviour in Aotearoa New Zealand for better disaster impact modelling using vehicle telemetry data

Stucki, E., Trent, N., L'Hermitte, C.

82 Using decision support system as an infrastructure network planning and visualisation tool for natural hazard risk assessment

Syed, Y., Uma, S.

83 A framework to estimate damage and potential blockages for road network under cascading hazards with propagation of uncertainties

Uma, S., Moratalla, J.

84 Improving Urban Food Supply Chain Resilience using DES of Local Supply Chains

Wight, J.

Inter-disciplinary Programme 4
Harnessing Disruptive Technologies for Earthquake Resilience

85 Extended Warning Window: A P-wave based Community-Engaged Earthquake Early Warning System

Chandrakumar, C., Prasanna, R., Holden, C., Stephens, M., Punchihewa, A., Tan, M.

86 CRISiSLab: Advancing Resilience through Innovative Technology for Disaster Management

Cui, A., Tan, M., Prasanna, R.

87 CrowdQuake: Earthquake Early Warning using IoT and Deep Learning

Kwon, Y.

88 Enhancing resilience - interdisciplinary machine learning research in QuakeCoRE

Wang, K., Mourot, P., Vorster, C., Ahn, H., **Liu, Y.,** Ye, X., Nair, N., McDonald, G.

89 Feasibility of LPWAN (Low Power Wide Area Network) based communication solutions for earthquake early warning (EEW) and building/infrastructure monitoring systems

Prasanna, R., Adikari, K., Holden, C., Punchihewa, A., Stephens, M., Drummond, P., Ravishan, D., Chandrakumar, C.

90 A Web Application to Map Disaster Impacts from Social Media Posts

Price, L., Stock, K.

91 AHP Analysis for Disaster Hazard Mapping to Optimize Solar and Wind Farm Site Selection

Rahayani, R., Nair, N.

92 Unleashing the Potential: AI at the Edge of Distributed EEW Network

Ravishan, D., Prasanna, R., Hudson-Doyle, E.

93 Understanding technology adoption of an earthquake early warning system through a continuance intention model

Tan, M., Vinnell, L., Valentin, A., Prasanna, R., Becker, J.

94 Hierarchical Federated Learning with Social Context Clustering-Based Participant Selection for Resilient Internet of Things Applications

Ye, X.

95 Intelligent and Data-driven Infrastructure Inspection and Management

Zou, Y., Nair, N., McDonald, G.

Poster Index

Presenting Author	Poster #
Agarwal, Setu Raman	23
Aigwi, Esther	67
Alger, Brandy	56
Anderson, Mitchell	75
Andige, Niranjan	39
Apriani, Indriana	24
Azul, Kristian	1
Bae, Sung Eun	2
Bora, Sanjay	3
Boston, Megan	59
Buck, Nicole	60
Campbell, Angie	40
Chandrakumar, Chanthujan	85
Chaneva, Jordanka	4
Chey, Min Ho	5
Church, Caelan	41
Clausing, Silke	42
Collins, Toni	43
Cui, Alicia	86
Daglish, Joshua	6
Daysh, Imogen	7
de la Torre, Christopher	8
Dicaprio, Christopher	9
Evans, Rachael	44
Fatourehchishabestari, Akram	45
Faulkner, Holly	46
Ferner, Helen	61
Formichetti, Giada	62
Gerstenberger, Matthew	10
Harvey, Julia	11
Holman, Beatrice	47
Horsfall, Sophie	68

Presenting Author	Poster #
Inal Kaynar, Cansu	69
Jaramillo-Velez, Alfredo	51
Jeong, Seokho	12
Khadka, Anish	76
Khalaji Assadi, Soheil	25
Kieu, Minh	53
Kuncar, Felipe	13
Kuwabara, Ryo	63
Kwon, Young-Woo	87
Lal, Rajnil	26
L'Hermitte, Cécile	77
Li, Lianyan	64
Lin, ShengLin	27
Liu, Yuan	88
Loghman, Vahid	14
Luo, Zheng	65
Mabin, Sarah	78
Magill, Christina	70
Mason, Doug	15
McDonald, Nathan	79
McEwan, Erin	16
Miranda, Catalina	48
Mostafa, Mohamed	28
Mowll, Richard	71
Nkrumah, Sally	66
O'Kane, Aisling	29
Pascua, Claire	30
Penney, Camilla	17
Prasanna, Raj	89
Prattley, Louisa	72
Price, Lydia	90
Rahayani, Rizki	91

Presenting Author	Poster #
Ramhormozian, Shahab	31
Ravishan, Danuka	92
Rincon Gil, Julian	32
Roundill, Melanie	73
Rowe, Caroline	54
Salimian, Mohammad Sadegh	33
Sarwary, Sulaiman	49
Saunders, Wendy	50
Scadden, Marcelle	57
Scheele, Finn	74
Schill, Claudio	18
Shariati, Amir	80
Siddiqui, Umair	34
Stahel, Karin	55
Stucki, Emma	81
Syed, Yasir Imtiaz	82
Tan, Marion Lara	93
Tapuke, Kelvin	52
Till, Henry	35
Tiwari, Ayushi	19
Uma, S R	83
Vercoe, Haukapuanui	58
Vincent, Katharine	20
Wallace, Thomas	21
Wang, Qi	36
Wight, Joshua	84
Ye, Xiaozhou	94
Yu, Tingting	37
Zhang, Junrui	38
Zhu, Chuanbin	22
Zou, Yang	95

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Waiata

Whakataka te Hau

Whakataka te hau ki te uru	*Cease the winds from the west*
Whakataka te hau ki te tonga	*Cease the winds from the south*
Kia mākinakina ki uta	*Let the breeze blow over the land*
Kia mātaratara ki tai	*Let the breeze blow over the ocean*
E hī ake ana te atakura	*Let the red-tipped dawn come with a sharpened air*
He tio, he huka, he hau hū	*A touch of frost, a promise of a glorious day*
Tīhei mauri ora!	

Te Aroha

Te aroha	*Love*
Te whakapono	*Faith*
Me te rangimarie	*Peace*
Tātou, tātou e	*For us all*
Tātou, tātou e	*For us all*

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