

Built Environment: Horizontal Infrastructure

Monthly Meeting

8/06/2020

Summary

- Introductions
- Presentation: 'Safety doesn't take a holiday': opportunities in understanding visitor risk exposure through infrastructure data – Mat Darling, University of Canterbury
- Presentation: Data-driven cities: bringing together machine learning and city simulation – Minh Kieu, University of Auckland
- Highlights and Discussion
- Other items

Highlights



- Recent dam and levee incidents and failures
- Thomas Wallace - Edgecumbe Flood

Improving our resilience to nature

By Associate Professor Liam Wotherspoon and Professor Tim Sullivan - 1

June 2020, Build 178

A team working on the built environment in the Resilience to Nature's Challenges National Science Challenge is developing new assessment, design and decision systems to help improve the resilience of our built environment.

<http://www.buildmagazine.org.nz/articles/show/improving-our-resilience-to-nature>



QuakeCoRE

NZ Centre for Earthquake Resilience
Te Hiranga Rū



National
SCIENCE
Challenges

RESILIENCE
TO NATURE'S
CHALLENGES

Kia manawaroa
– Ngā Ākina o
Te Ao Tūroa

Papers

Landslides

DOI 10.1007/s10346-020-01417-3

Received: 23 August 2019

Accepted: 21 April 2020

© Springer-Verlag GmbH Germany
part of Springer Nature 2020

P. L.-F. Liu · P. Higuera · S. Husrin · G. S. Prasetya · J. Prihantono · H. Diastomo · D. G. Pryambodo · H. Susmoro

Coastal landslides in Palu Bay during 2018 Sulawesi earthquake and tsunami

<https://rdcu.be/b4k34>






sustainability



Article

National-Scale Built-Environment Exposure to 100-Year Extreme Sea Levels and Sea-Level Rise

Ryan Paulik ^{1,*} , Scott A. Stephens ² , Robert G. Bell ² , Sanjay Wadhwa ² and Ben Popovich ¹


¹ National Institute of Water and Atmospheric Research (NIWA), 301 Evans Bay, Greta Point, Wellington 6021, New Zealand; benjamin.popovich@niwa.co.nz

² National Institute of Water and Atmospheric Research (NIWA), Gate 10, Silverdale Road, Hillcrest, Hamilton 3216, New Zealand; Scott.Stephens@niwa.co.nz (S.A.S.); rob.bell@niwa.co.nz (R.G.B.); sanjay.wadhwa@niwa.co.nz (S.W.)

* Correspondence: ryan.paulik@niwa.co.nz



Assessment of the historic seismic performance of the New Zealand highway bridge stock

Shong Wai Lew^a , Liam Wotherspoon^a, Lucas Hogan^a, Moustafa Al-Ani^b, Pavan Chigullapally^a and Vinod Sadashiva^c

^aDepartment of Civil and Environmental Engineering, University of Auckland, Auckland, New Zealand; ^bCompusoft Engineering Ltd, Auckland, New Zealand; ^cGNS Science Ltd, Lower Hutt, New Zealand

ABSTRACT

This paper presents the assessment of historic seismic bridge performance of the New Zealand highway bridge stock from the 1968 Inangahua earthquake through to the 2016 Kaikōura earthquake. Spatial ground motion details based on recorded and observed ground motion intensities were used to estimate the peak ground acceleration (PGA), as a measure of the seismic demand at each bridge location. Across all events, a PGA of 0.05 g or higher was experienced on over 800 occasions across bridge sites. Damage characteristics were collated from available literature, with the majority of the highway bridges experiencing either no damage or only minor damage across all the events. At PGAs greater than 0.5 g, the number of bridges with moderate and major damage was still relatively small. There were also no apparent differences between the performance of bridges across the different design eras, despite the varied design and construction practices. Some shorter bridges may have performed better than expected due to the effect of abutment stiffness and damping, while some longer bridges may have performed well due to travelling wave effects. These findings will inform future assessment methods and design, and the accuracy of analytical modelling of the bridge stock.

ARTICLE HISTORY

Received 11 September 2019
Revised 8 January 2020
Accepted 19 January 2020

KEYWORDS

Bridges; fragility; historic earthquakes; network vulnerability; New Zealand; seismic assessment; seismic performance

Risk Analysis

AN INTERNATIONAL JOURNAL

An Official Publication of the Society for Risk Analysis

Original Research Article

Reframing Resilience: Equitable Access to Essential Services

Tom M. Logan , Seth D. Guikema

First published: 13 May 2020 | <https://doi.org/10.1111/risa.13492>



ELSEVIER


Landscape and Urban Planning

Volume 201, September 2020, 103841



Parks and safety: a comparative study of green space access and inequity in five US cities

Tim G Williams ^{a,1} , Tom M. Logan ^{b,1} , Connie T Zuo ^a , Kevin D Liberman ^a , Seth D Guikema ^a 

Show more 



QuakeCoRE

NZ Centre for Earthquake Resilience
Te Hiranga Rū



National
SCIENCE
Challenges

RESILIENCE
TO NATURE'S
CHALLENGES

Kia manawaroa
– Ngā Ākina o
Te Ao Tūroa



Remote Sensing of Environment

Volume 247, 15 September 2020, 111861



Night and day: The influence and relative importance of urban characteristics on remotely sensed land surface temperature

T.M. Logan ^a  , B. Zaitchik ^b, S. Guikema ^c, A. Nisbet ^d 

BNZSEE

- Resilience of Infrastructure Networks special issue
- 5+ papers from RNC researchers
- Research-industry balance
- End of year publication

Papers & Highlights

- Send through recently published papers
- Highlight at end of monthly meetings

Other Items

ANTICIPATE, REACT, RECOVER

Resilient infrastructure systems

NATIONAL
INFRASTRUCTURE
COMMISSION

May 2020



ITRC
infrastructure



Resilience study research for NIC

Systems analysis of interdependent network vulnerabilities

Final Report
April 2020

Dr. Raghav Pant
Mr. Tom Russell
Dr. Conrad Zorn
Dr. Edward Oughton
Prof. Jim W. Hall

Environmental Change Institute
University of Oxford
South Parks Road
Oxford, OX1 3QY

<https://www.nic.org.uk/>



NZSEE 2020 Webinar Series | 4

Infrastructure Session

We are pleased to announce our speakers and registration details for the 4th Webinar in the NZSEE 2020 series, on **Infrastructure**.

We would like to acknowledge and thank our series partner EQC, and our sponsors who are providing support for these events.

Thursday 11th June, 12pm: Infrastructure Session

From dams to road networks, infrastructure is fundamental to the functioning of society. In this session the speakers will present on the seismic performance of infrastructure and the impact it can have on the resilience of our communities.

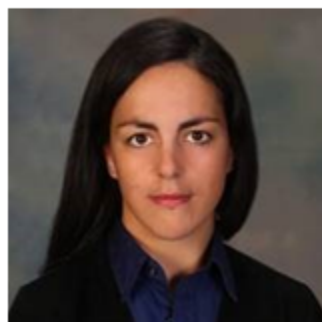
[Register here](#) or below.



Multi-scale infrastructure analytics for seismic risk assessment

Conrad Zorn (Lecturer, University of Auckland)

This presentation will cover recent research into the impact of seismic risks to infrastructure networks at multiple-scales. Particular focus on the role of interdependencies in infrastructure network recovery from major disruptions – such as an Alpine Fault (AF8) project case-study. Finally, future research areas and on-going projects are discussed.



Aotearoa embankment infrastructure: Understanding and safeguarding our dams and stopbanks

Dr Kaley Crawford-Flett (Research Engineer, University of Canterbury)

This presentation will provide an overview of dam and stopbank (levee) infrastructure in Aotearoa, New Zealand, including: (1) critical functions of this ubiquitous infrastructure, (2) challenges to embankment resiliency in our seismic environment, and (3) research to understand and address specific geotechnical vulnerabilities as well as broader engineering unknowns.



QuakeCoR

NZ Centre for Earthquake Resilience
Te Hiranga Rū

ICE
RE'S
IGES

Kia manawaroa
– Ngā Ākina o
Te Ao Tūroa

Document Library

- Papers and reports from RNC research, NZ industry and international projects
- Under construction
 - Link to be disseminated

Other Items

- Slack Channel
 - To join:
 - <http://bit.ly/rnc-infrastructure>

Any Other Items?

- Wiki:

<https://wiki.canterbury.ac.nz/display/QuakeCore/Special+Project+1%3A+Spatially-distributed+Infrastructure>