

RESILIENCE  
TO NATURE'S  
CHALLENGES

Kia manawaroa –  
Ngā Ākina o  
Te Ao Tūroa

# TE TAI WHANAKE

Growing a stronger, more resilient Aotearoa.

📍 Te Papa, Wellington 13 & 14 May 2024



# Learning from past events to lift community resilience



**Chair:**  
Professor  
Tom Wilson  
*University of  
Canterbury /  
NEMA*



Ngarangi  
Walker  
*Te  
Rūnanganui o  
Ngāti Porou*



Dr Murry Cave  
  
*Gisborne  
District Council*



Dr Andrea  
Wolter  
  
*GNS Science*



Professor  
Liam  
Wotherspoon  
*University of  
Auckland*



Professor  
David  
Johnston  
  
*Massey  
University*



Professor  
Christine  
Kenney  
  
*Massey  
University*



# NGATI POROU TIMA TAI AO

LEARNING FROM DISASTER EXPERIENCES...  
... TO BUILD COMMUNITY READINESS...





# KO WAI TATAU?

NGA HAPU O  
NGATI POROU

photo credits: Te Ara and Te Runanganui o Ngati Porou







## ROHenga

### 1 Potikirua ki Whangaokeno

1. Potaka
2. Hinemaurea
3. Punaruku
4. Paerauta (Tutua)
5. Hinerupe
6. Matahi o te Tau
7. Awatere
8. Te Kahika (Hurae)

### 2 Whangaokeno ki Waiapu

9. Putaanga
10. Kaiwaka
11. Rahui
12. Taumata o Tapuhi
13. Hinepare
14. Ohine Waiapu
15. Karuai

### 3 Pohautea ki Te Onepoto

16. Tikapa
17. Te Horo
18. Waiomatatini
19. Kakariki
20. Tinatoka

### 4 Te Onepoto ki Rahuimanuka

21. Reporua
22. Umuariki
23. Ruataupare
24. Mangahanea
25. Uepohatu
26. Rauru (Taumata o Mihi)
27. Te Heopera (Mangarua)

### 5 Rahuimanuka ki Mataahu

28. Kariaka
29. Hiruharama
30. Te Aowera
31. Whareponga
32. Rongohaere (Pahou)
33. Rongoitekai (Penu)

### 6 Mataahu ki Kokoronui

34. Te Ariuru
35. Waiparapara
36. Pakirikiri
37. Tuatini
38. Iritekura
39. Taharora
40. Te Kiekie

### 7 Kokoronui ki Te Toka a Taiiau

41. Anaura
42. Hinemaurea ki Mangatuna
43. Okuri
44. Puketawai
45. Hauiti
46. Te Poho o Rawheoro
47. Whangara
48. Te Poho o Rawiri

## MARAE

### POTIKIRUA

SH35

X HIKURANGI

TE TOKA A TAIU







# Foundation Principles

## TOITU TE MANA ATUA

How whanau regulate and undertake activities on, over or within their rohe.

## TOITU TE MANA WHENUA (ME TE MANA MOANA)

Recognising the unbroken, inalienable and enduring mana of whanau.

## TOITU TE MANA TANGATA

Recognising the right of whanau to exercise influence over activities impacting their rohe.

## TOITU TE MANA TIRITI

Acknowledges the partnerships between Ngati Porou and the Crown will be based on honour and integrity.





**The Ngati Porou rohe is enriched by its Indigenous flora and fauna and biodiversity: effective biosecurity; and responsiveness to future impacts like climate change**

Strategic Objective 2021-2024



# Our Priorities



## WHENUA

Soil Science  
Agriculture  
Horticulture



## WAI

Waitai/ Marine  
Waimaori/ Fresh



## WHANAU

Social/ Cultural  
Matauranga  
Mahi



# NGA MAHI - PRE 2023 SEVERE WEATHER EVENTS



## WAIAPU CATCHMENT PLAN

Support GM Taiao and Tima Taiao to deliver communication and engagement.

## RMA REFORMS

Support GM Taiao and CEO to continue the reforms mahi.

## IWI TECHNICAL TRIAL

Support GM Taiao and Tima Taiao to continue the mahi with GDC for the regional and local level planning.

























# Challenges

**RULES & REGULATIONS** - Whanau are struggling to survive and don't always have the ability to meet their own needs let alone, GDC, MFE, MPI policy changes and regulations.

**ROADING** - continues to be a constant and the recovery and rebuild of State Highway 35 is HUGE project for us to ensure the connectivity of whanau ki te whenua mo o ratau waimaori, waitai hoki.

**COMMS** - ensuring the integrity of *our* ability to stay connected as a team, an organisation and linked in with TEMO and others during an emergency, regional or national response.

**POWER** - solar at the whanau and marae level. Even flying fuel is challenging!

**HAUORA** - kaimahi and their whanau are feeling the impacts of the extreme weather events and this is manifesting in health and wellbeing





## TOITU TE MANA ATUA

- GM - Taiao
- People, Culture, Capability Manager
- Principal Planner

## TOITU TE MANA TANGATA

- Kaimahi taiao
- Kaikorero taiao/ matauranga maori
- EA/ Project Coordinator

## TOITU TE MANA WHENUA (ME TE MANA MOANA)

- Kaiputaiao whenua
- Kaiputaiao moana
- Kaiputaiao waimaori

## TOITU TE MANA TIRITI

- Principal/Senior Public Policy Advisor
- Policy Analyst
- Data analyst/ scientist



# SDGS TO SUPPORT NGATI POROU TIMA TAI AO



To support sustainable development of LIFE BELOW WATER and LIFE ON LAND requires QUALITY EDUCATION





































DATE: \_\_\_\_\_  
SITE: \_\_\_\_\_  
PROJECT NO: \_\_\_\_\_  
CORE NO: \_\_\_\_\_  
FROM \_\_\_\_\_





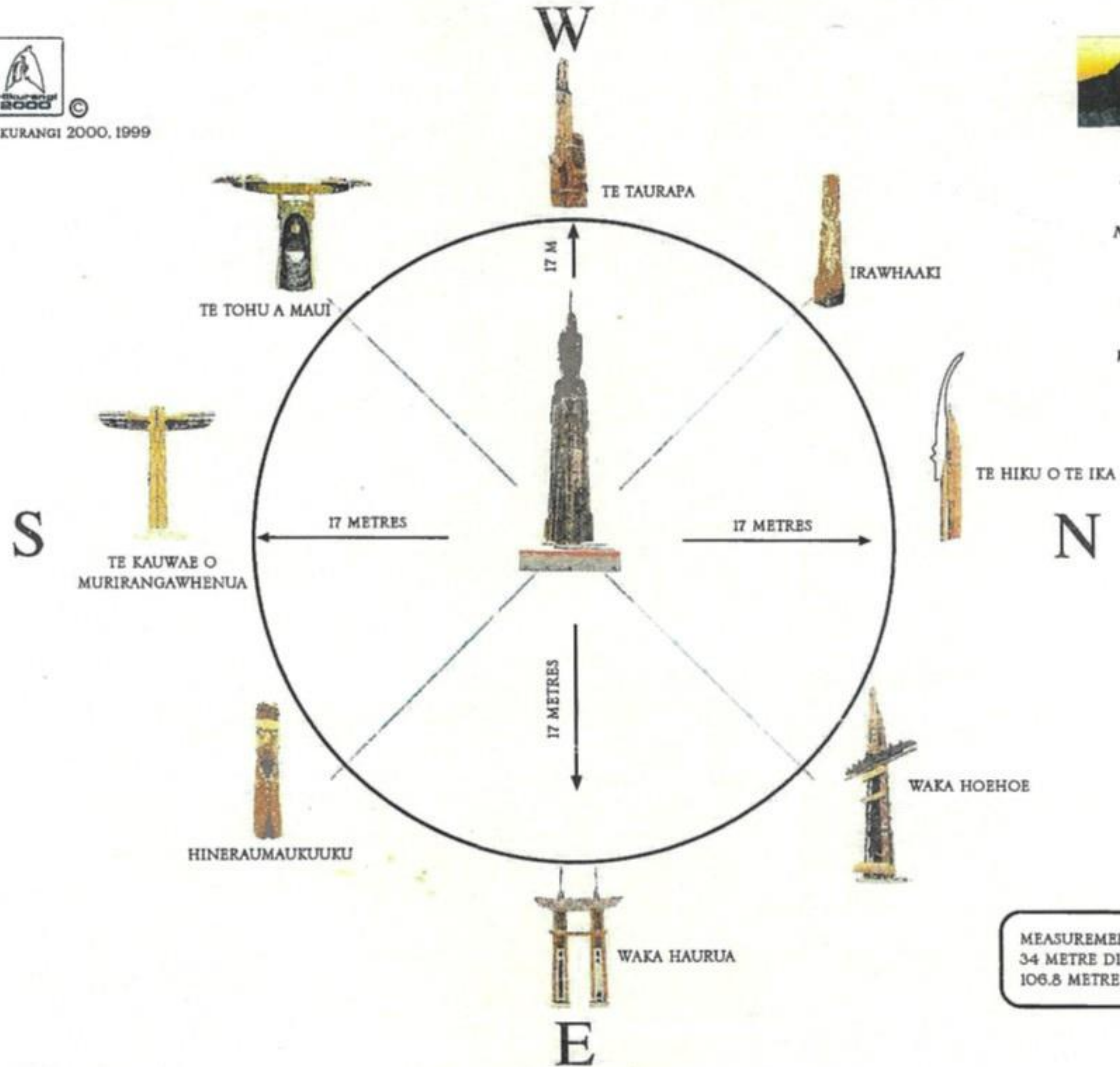








COPY RIGHT HIKURANGI 2000, 1999



*"Ko Hikurangi te  
Maunga  
Ko Waipua te Awa,  
Ko Ngati Porou te  
Iwi"  
Nau mai! Haere mai!*

*Hikurangi is the  
Mountain  
Waipua is the River  
Ngati Porou is the  
Tribe  
Welcome! Welcome!*



# TIMA TAIAO

## APPROACHES TO RESPONSE, RECOVERY & RELATIONSHIPS

### MAHI HOU

Innovation is applying creativity  
to generate new solutions

### RANGAHAU

Research that is  
informed by our  
people and our  
places

### PUTAIAO

Applied science that  
uses what we know  
in practical ways for  
our people and our  
places

### HANGARAU

Information,  
communication  
technology that aids  
our mahi and ability  
to go faster









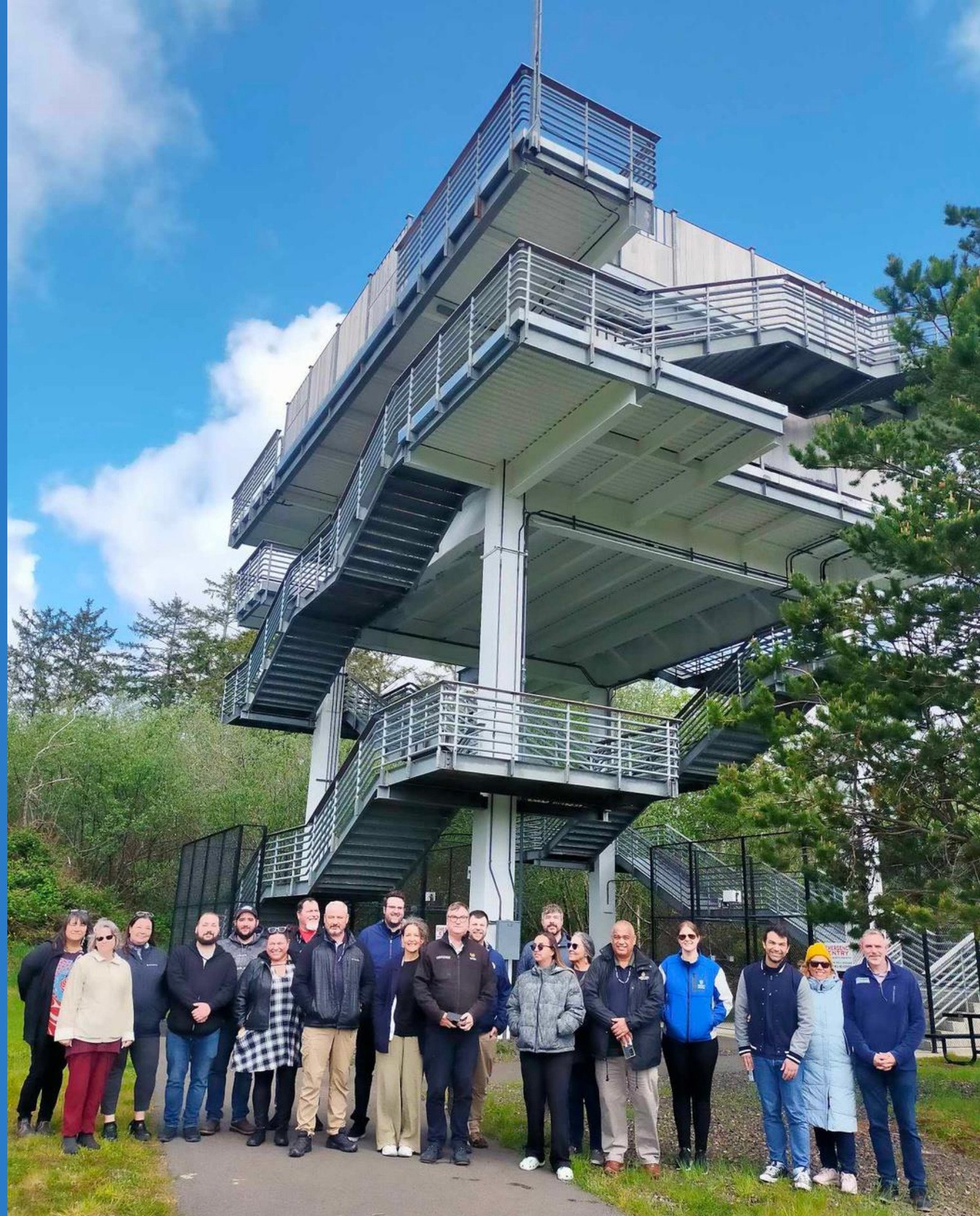












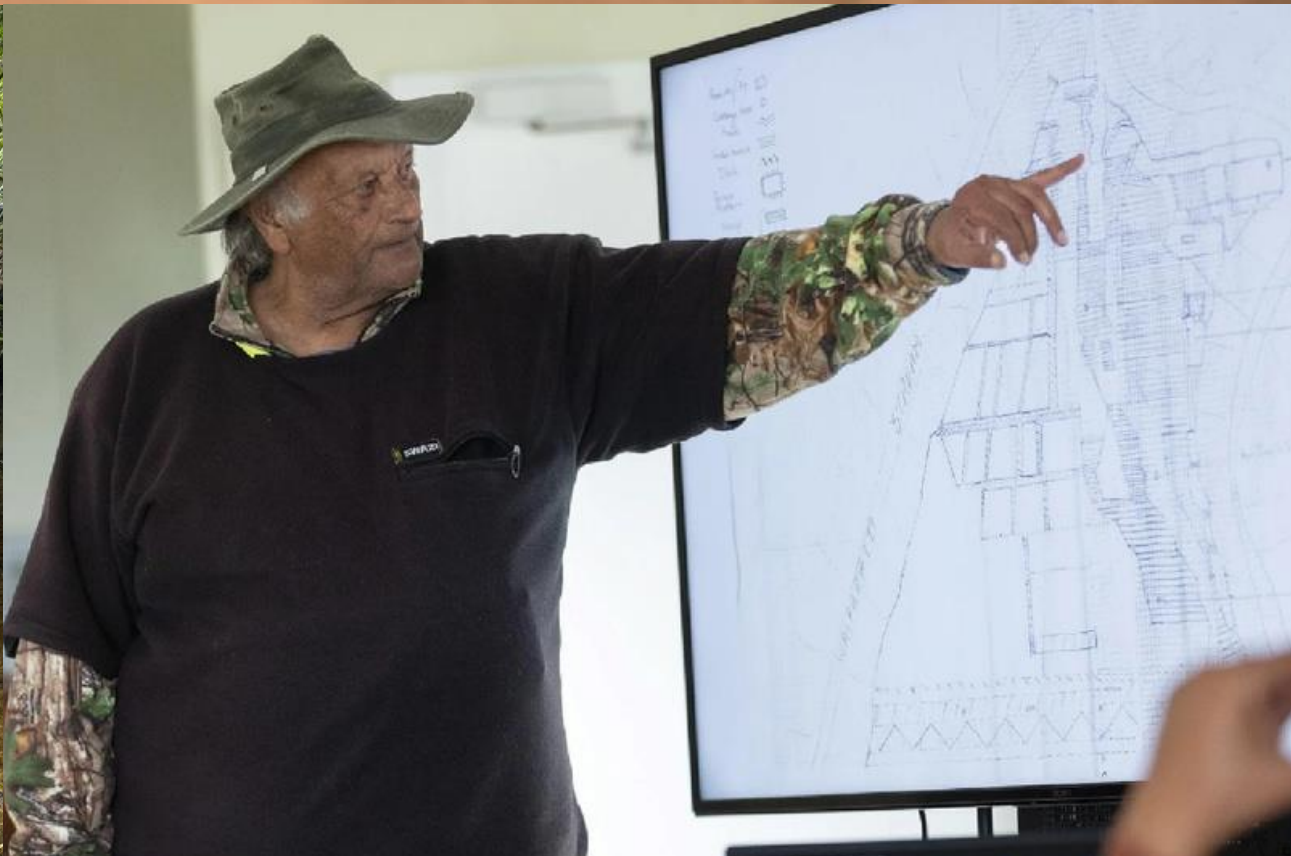












*Ke a tatau nei mahi  
mo te tau 2024  
He wai mo te whanau  
He kai mai te whenua  
He ika mai te moana*





# Lessons from Gabrielle in Gisborne/Tairāwhiti



Te Kaunihera o Te Tairāwhiti  
**GISBORNE**  
DISTRICT COUNCIL



Dr Murry Cave Principal Scientist Gisborne District Council



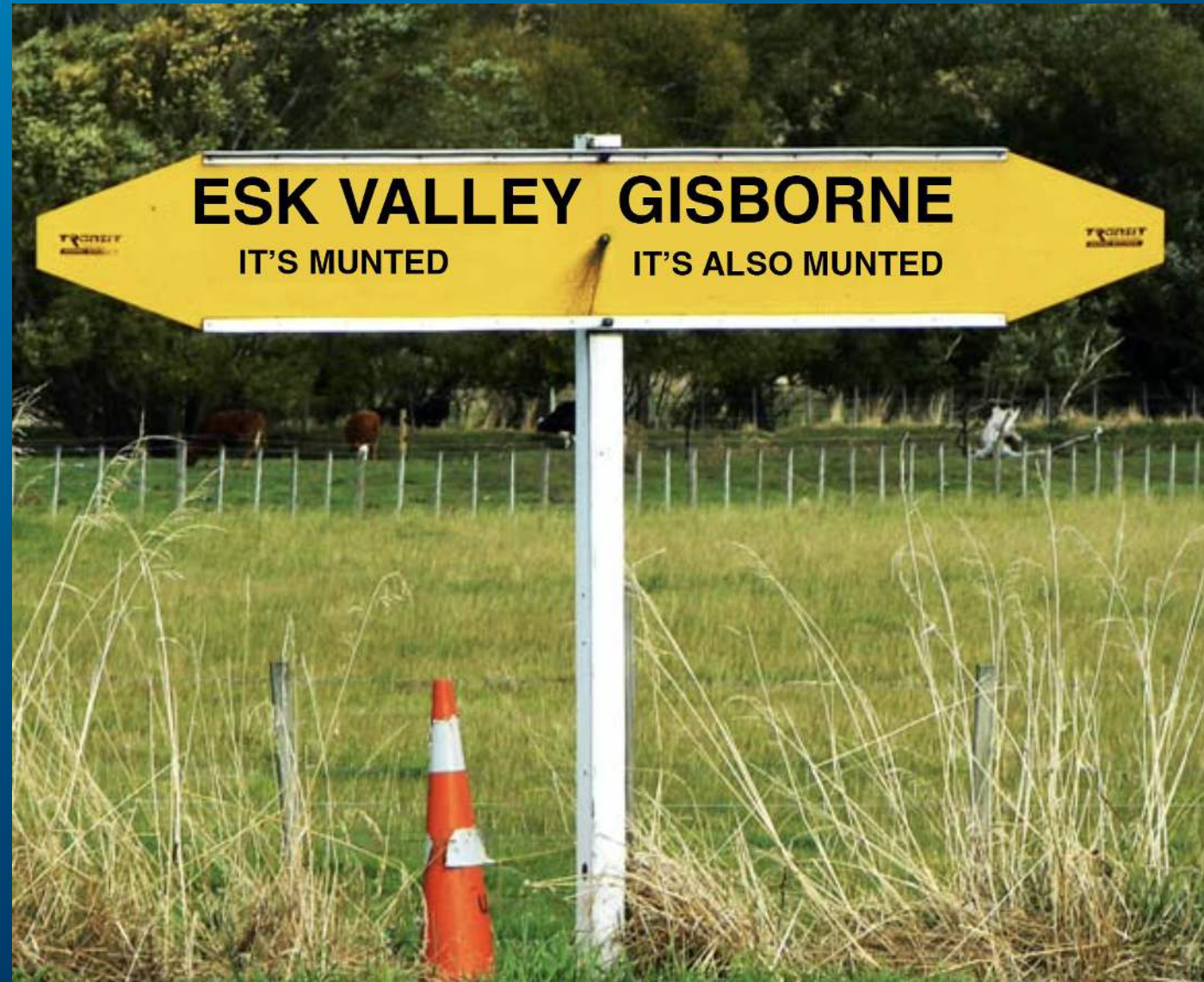
# Just another storm? Not our first Rodeo

Page

02

March 2015	Ex TC Pam. Regional Severe
April 2017	Ex TC Debbie & Cook Severe
	Uawa, Tokomaru, Waipaoa
June 2018	Very Severe
	Uawa (4-5 <sup>th</sup> ) 11 <sup>th</sup> -12 <sup>th</sup> Waipaoa
Nov. 2021	Very Severe City flooding and landslides
March 2022	Regional Very Severe
	Tokomaru & Anaura Bay Flooding

Jan 2023 8 <sup>th</sup>	R&V Storm City Localised Severe
	short duration high intensity
Jan 2023 11-13 <sup>th</sup>	Ex TC Hale Very Severe
Feb 2023 11 <sup>th</sup> -13 <sup>th</sup>	Ex TC Gabrielle Very Severe
Feb 2023 27-28 <sup>th</sup>	Son of Gabrielle City Localised Severe
	short duration high intensity
June 2023 26 <sup>th</sup>	Regional Very Severe
September 2023 26 <sup>th</sup>	Regional South Severe.
	Tiniroto Landslide Dam
October 2023 30-31 <sup>st</sup>	Ex TC Lola. Severe.
	Tolaga North



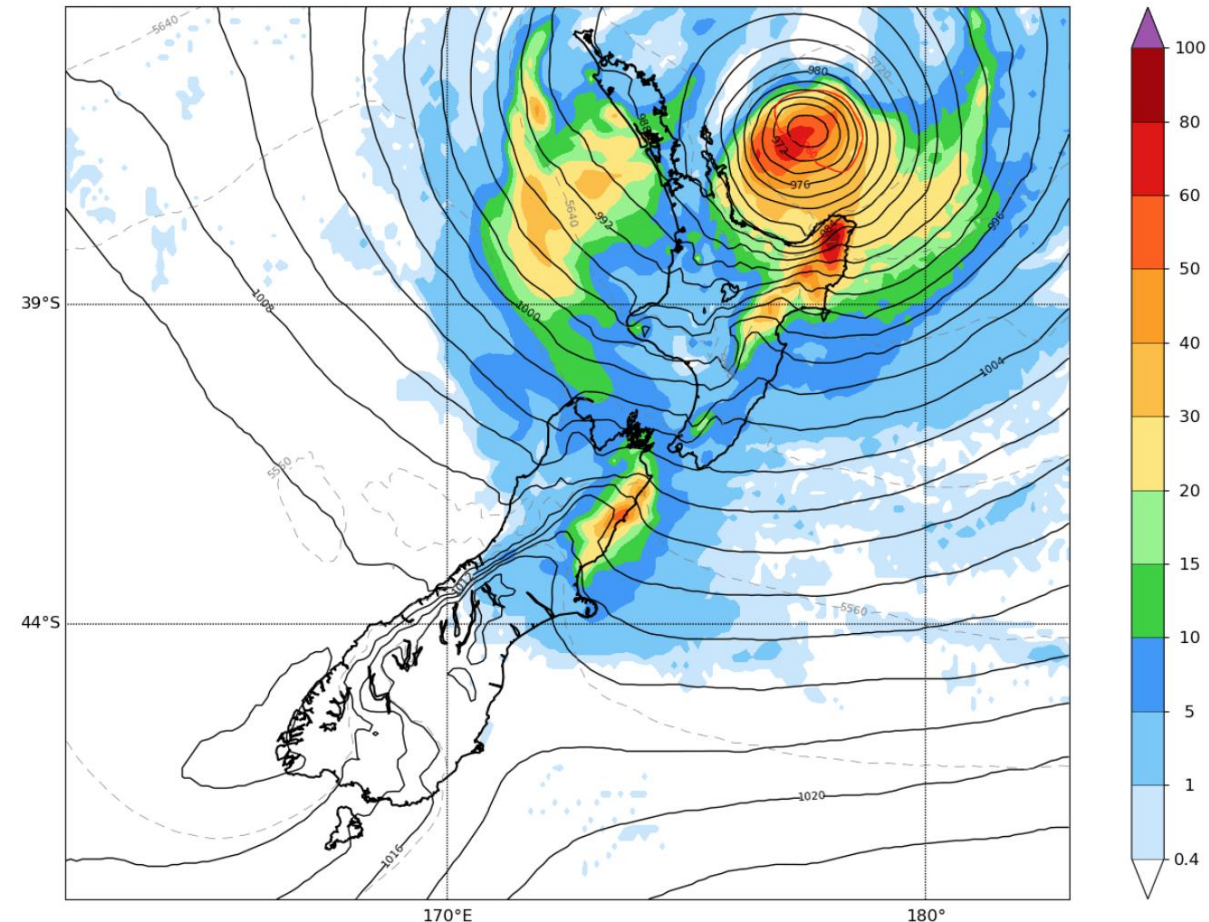


# The Response

- 10 days advanced warning internally 4<sup>th</sup> Feb MetService Heavy Rain watch 10<sup>th</sup> Feb.
- Support mobilised early
- No event can ever be perfectly managed; %\$# will happen.
- (learn from it, get over it, move on)
- The recovery process is hard
- We are still in response mode
- Gisborne/Tairawhiti benefited from;
  - A well practiced CDEM group (not our first rodeo)
  - A CEG that was well established, where everyone knew and trusted each other.
- Community expectations can never be met
  - Requests for food, fuel, etc on Day One from people not requiring evacuation nor under a threat to life suggests a lack of community preparedness and resilience.

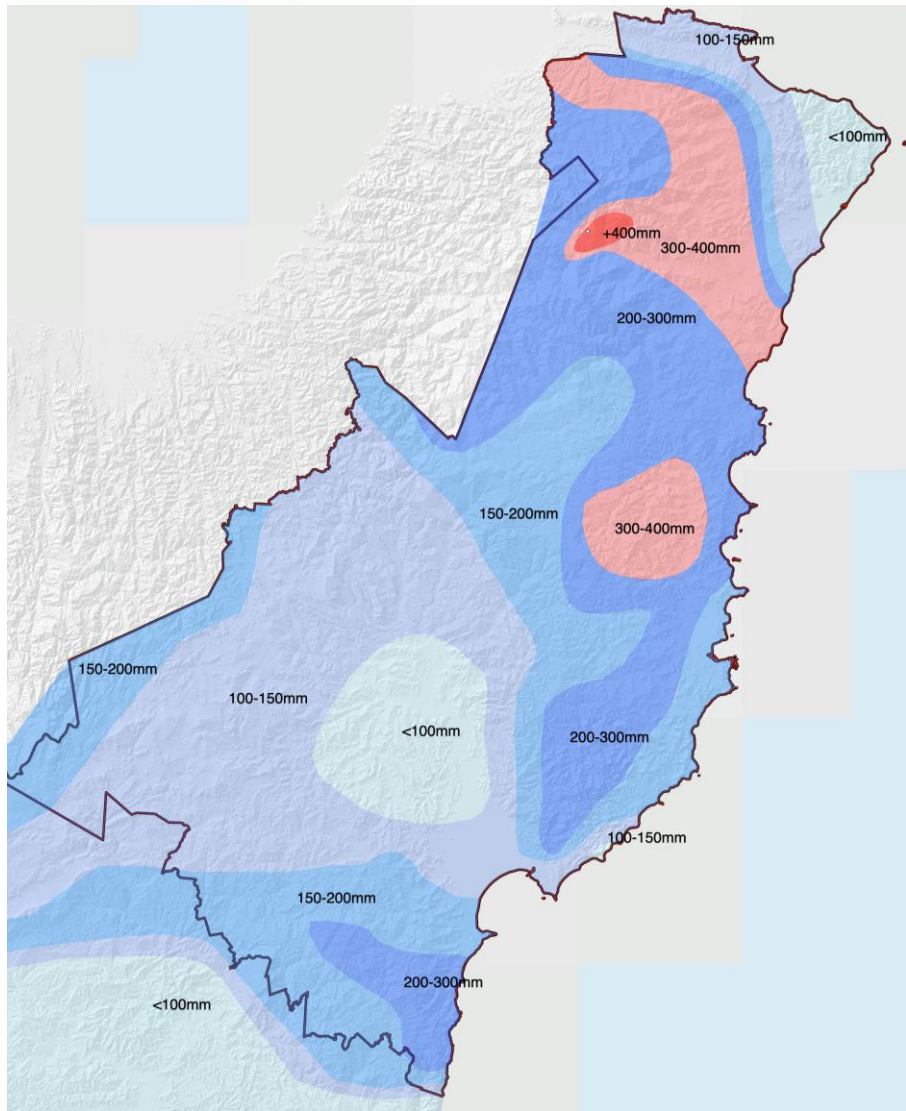
Data Source: ECMWF AusNZ  
Validity: H+240  
Model Run UTC: 2023-02-03 12:00:00

Field(s): MSL (hPa), 1000-500 Thickness (gpm), Rainfall Six Hourly (mm)  
Chart Time NZDT: Tuesday 2023-02-14 01:00:00  
Chart Time UTC: 2023-02-13 12:00:00

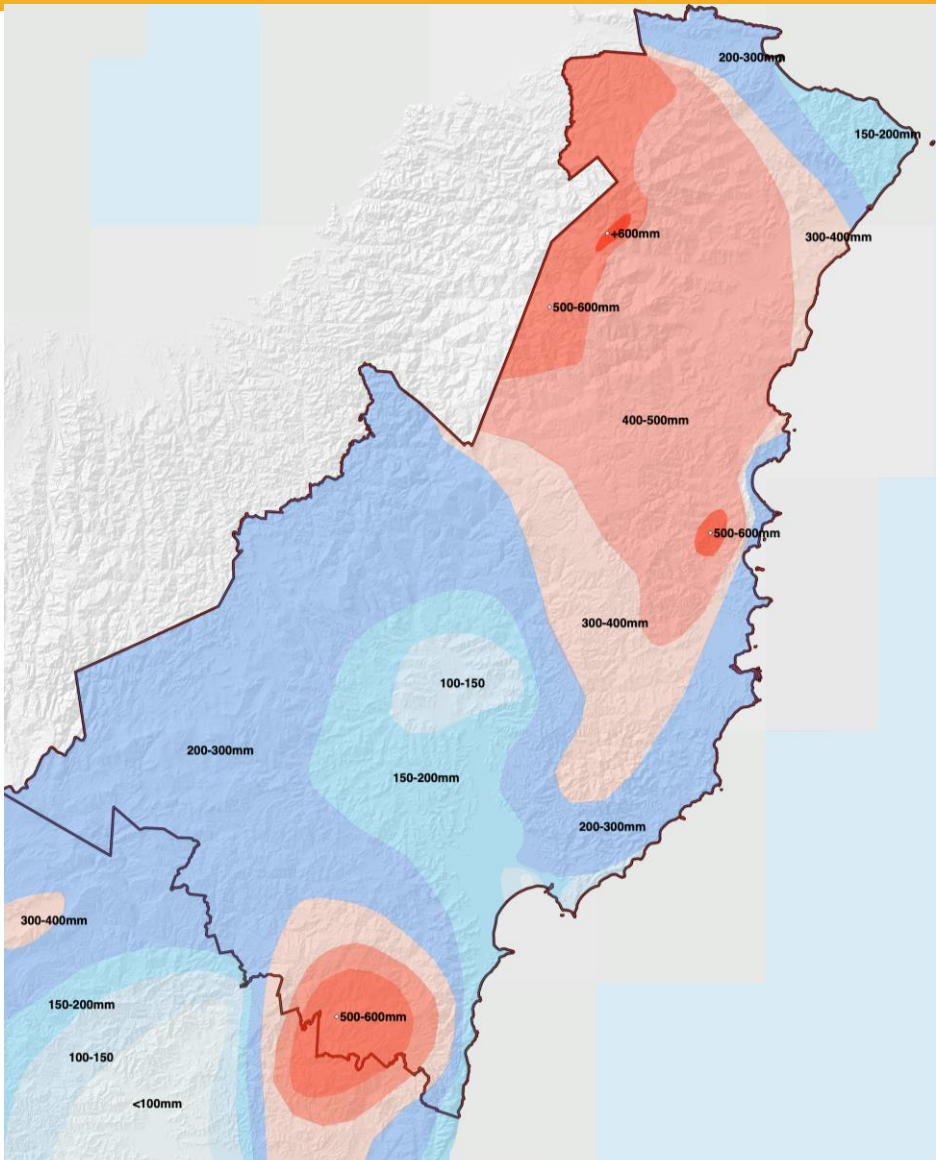




# Cyclones Hale & Gabrielle were very different storms



Cyclone Hale January 2023



Cyclone Gabrielle Feb 2023





## Impacts

### Communication networks

(whoever was it who thought it was a good idea to load critical infrastructure to the undersides of bridges? Don't do it again!!)

### Water supply pipeline

### Roads and Bridges

### Landslide dams

### Housing

### Marae and Whenua Maori land

1 fatality, c.19 close calls





Most breaks the result of pine logs  
45 days to get water flowing again (but much more to do)  
Backup Waipaoa water treatment plant intake smothered by mud

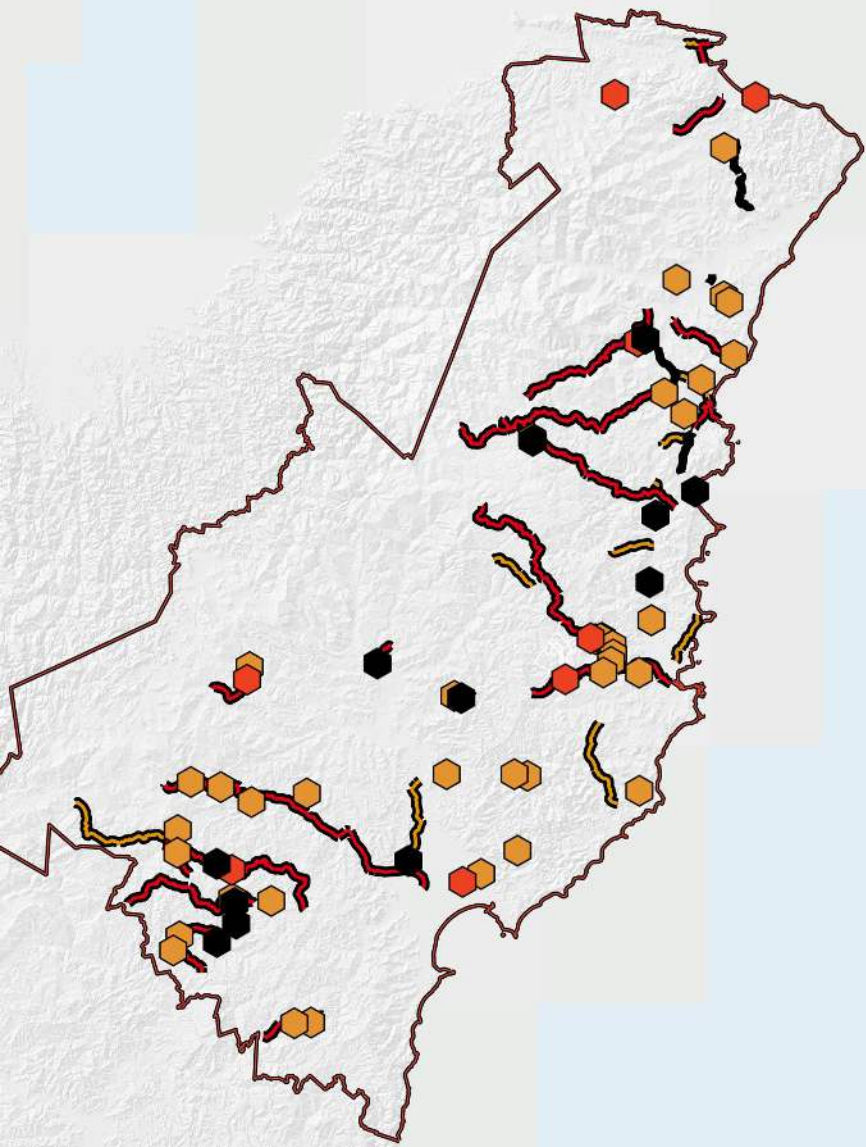




# Bridges and Roads

Page

07



12 Bridges lost (11 due to LWD & 1 due to a house bus)

8 Severely damaged.

39 Badly damaged. Overall 140 bridges impacted.

22 local roads closed.

SH 35 and 2 closed in 6 locations.

Contractors built a new road bypassing Hikuwai #1 SH bridge in 43 days.

Many repairs temporary and network still fragile May 2024.

Tokomaru Bay Isolated 6 weeks





# Houses

## Regional extent

321 Building Act Placards.

53 Red,  
270 yellow. Still have yellows transitioning to red.

## Future of Severely affected land

1800 initially in FOSAL Cat 2; now a lot less!

## Category Three

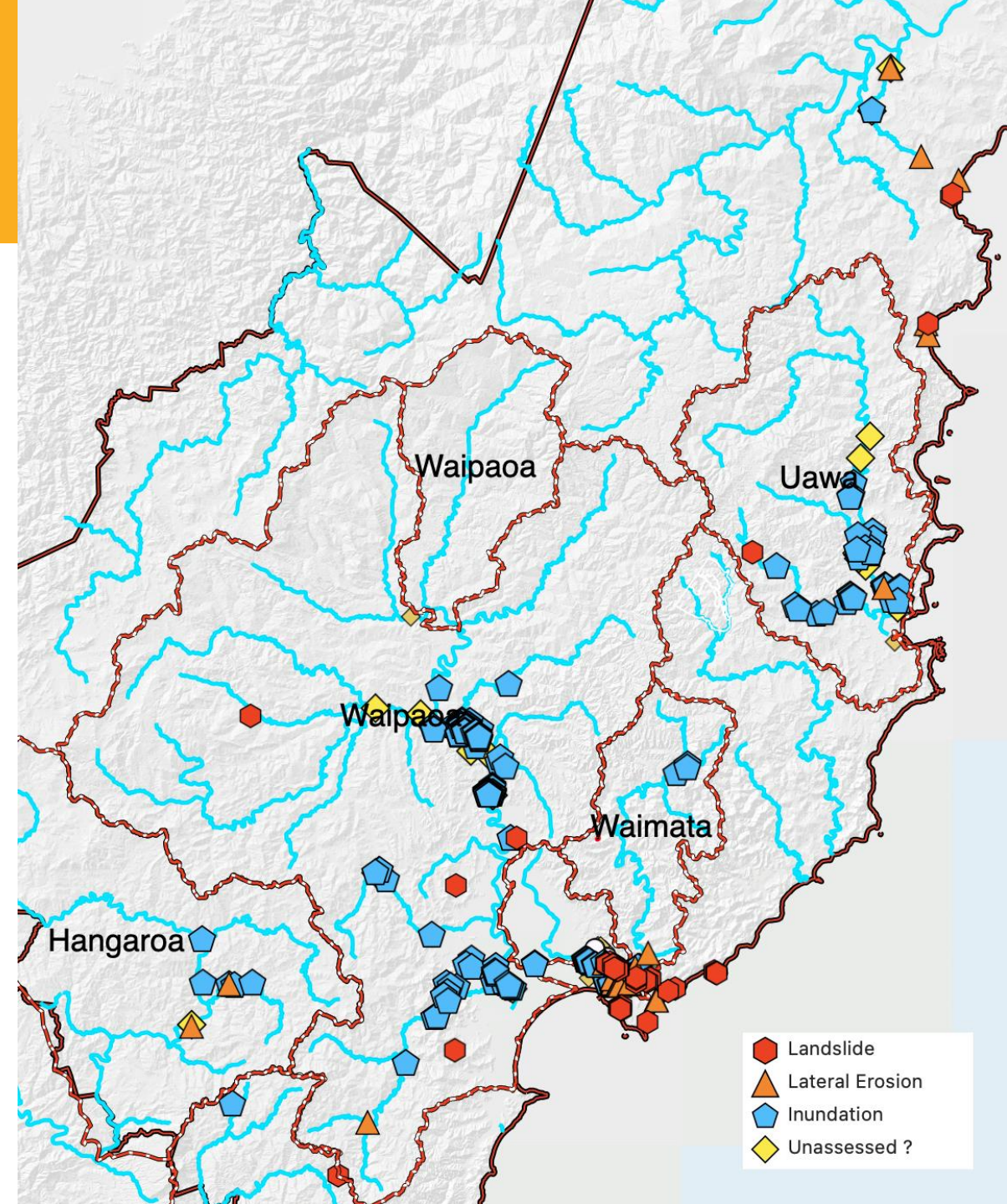
63 Dwellings at present

25 Dwellings impacted by landslides

6 Dwellings impacted by lateral erosion

32 Dwellings due to Inundation

4 Marae









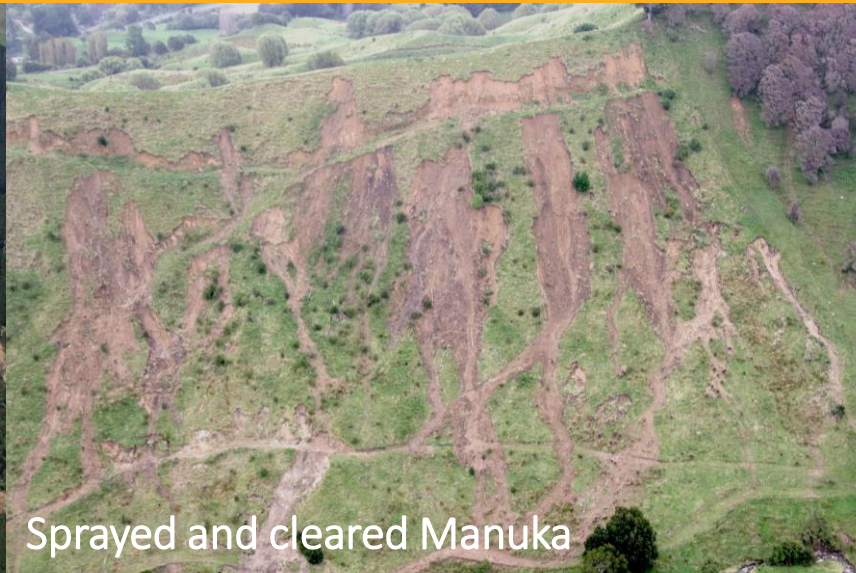
Closed Canopy forest



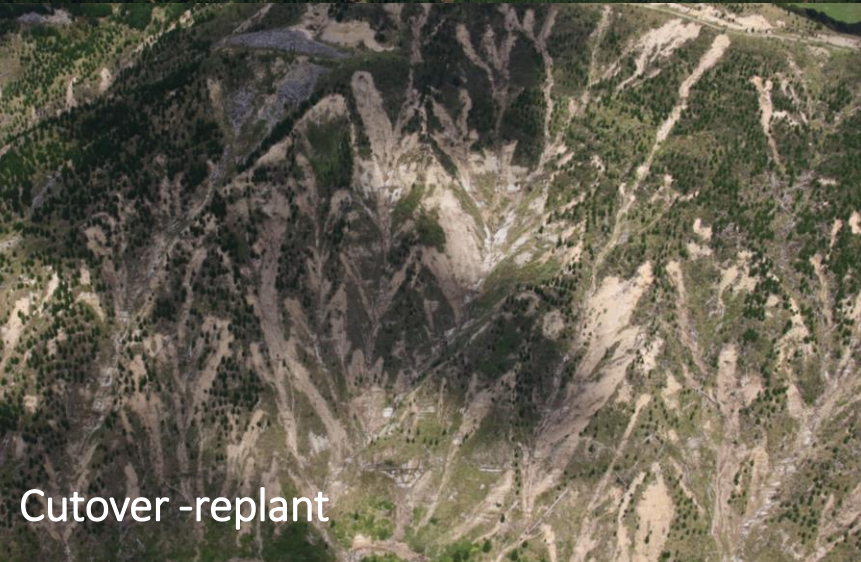
Desiccated for permanent forest



Sprayed and cleared Manuka



Pasture



Cutover -replant





# Role of “Intelligence” in response and recovery

Page

11

38 Chopper flights

10,000+ georeferenced images

2 new aerial mapping surveys

Very high resolution LiDAR surveys,  
Te Arai/Waipaoa, Waiorongomai,  
Uawa, Mangahauini.

New high resolution Regional LiDAR

Many drone mapping flights.

Science response programme

- Impact flood depth/velocity on survivability
- Review of flood warning manual
- Woody debris mapping
- Landslide mapping
- CSSI & eDNA sediment sources
- etc

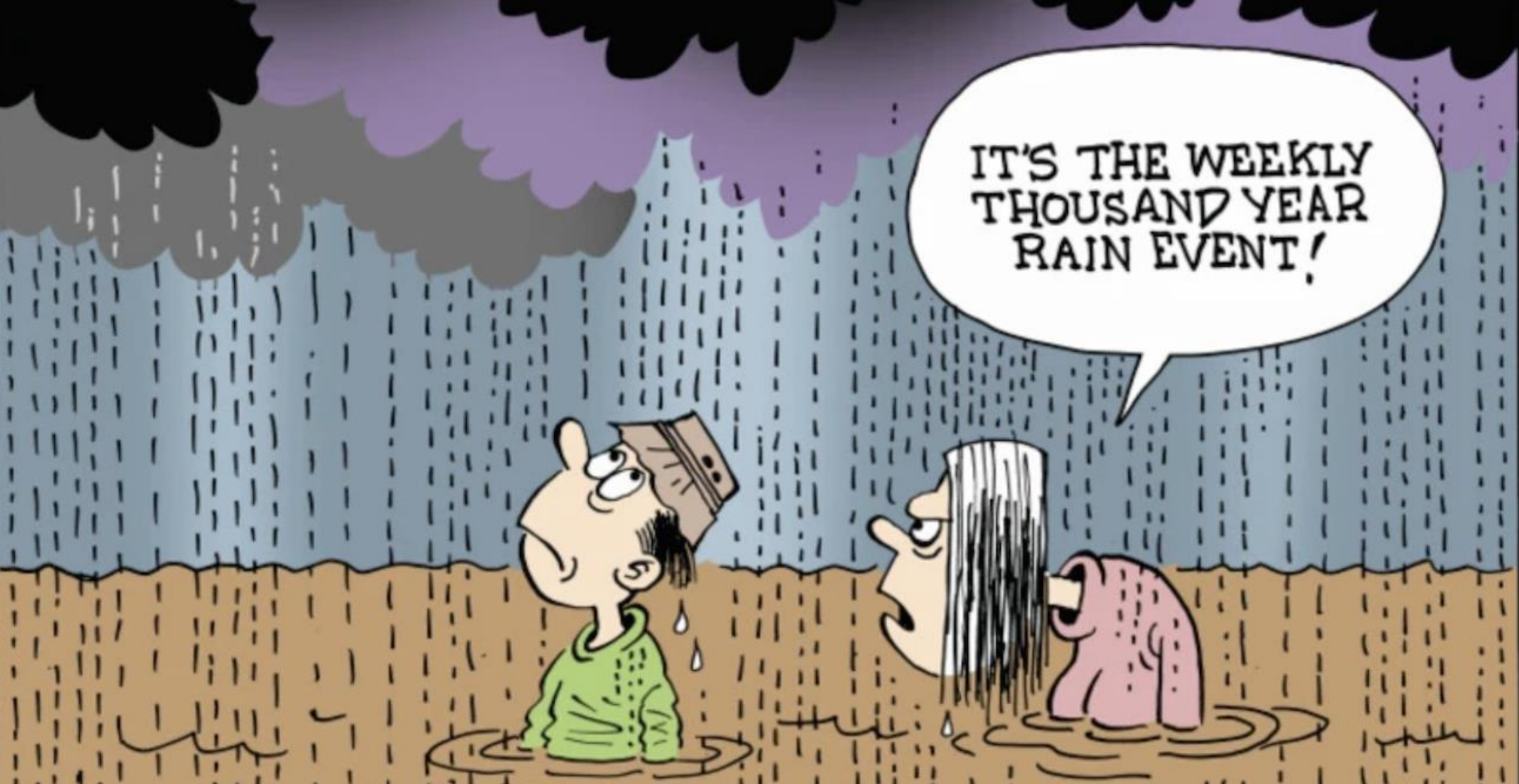




## Learn from past mistakes, don't repeat them.

- In Gisborne/Tairāwhiti Post-Bola, pine was seen as the solution. No real consideration of harvest. Now part of the problem. LWD and sediment loading will be the elephant in the room for many years.
- Advisors need to listen to the regions to understand the scale of the issues & understand the human cost.
- Insurers, Govt Agencies, Councils & community need to work more closely: CEG's & ECC's need the right people in the room.
- We need to rethink the EQC/Insurer process. Particularly we need to rethink land damage. Paying out the lesser of the cost of mitigation or the land value transfers the liability to future generations.
- FOSAL has been a missed opportunity to address managed retreat.
- None of the post-event reviews have considered the role and function of science in response & recovery.
- Did the current reviews really help us move forward; blame not learning, hearing what you wanted to hear?
- Where is the technical report that describes the event across regions (rainfall, flooding, landslides, sediment load, environmental damage) so we can have a head start for the next big storm?





Thank You





# Science Response at Community Level

National  
**SCIENCE**  
Challenges

RESILIENCE  
TO NATURE'S  
CHALLENGES

Kia manawaroa –  
Ngā Ākina o  
Te Ao Tūroa

Andrea Wolter, [a.wolter@gns.cri.nz](mailto:a.wolter@gns.cri.nz)

THANK YOU:

Iwi

Universities

TTA/EQC

Scion

GNS Colleagues

Councils, CDEM

NEMA

NIWA

consultants

Communities!

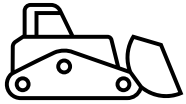


**GNS**  
**SCIENCE**  
TE PŪ AO



# Landslide costs in Aotearoa:

- Annualised losses of \$250-300 million/year
- Most claimed for natural hazard at Toku Tū Ake EQC
- ~1,500 fatalities since 1760



Abbotsford 1979  
\$14 M



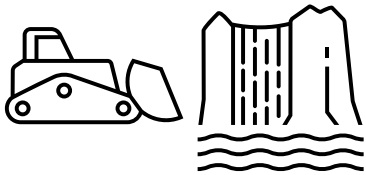
Manawatu Storm  
(Feb 2004):  
\$458 M



Debbie (2017)  
\$500 M



Jan 2023 Auckland  
Anniversary >\$1 B



Clyde Dam 1980s  
\$936 M



Kaikoura 2016  
SH1 \$1.3 B



Nelson Storm (Aug 2022)  
\$140-160 M



Gabrielle (2023)  
>\$10 B

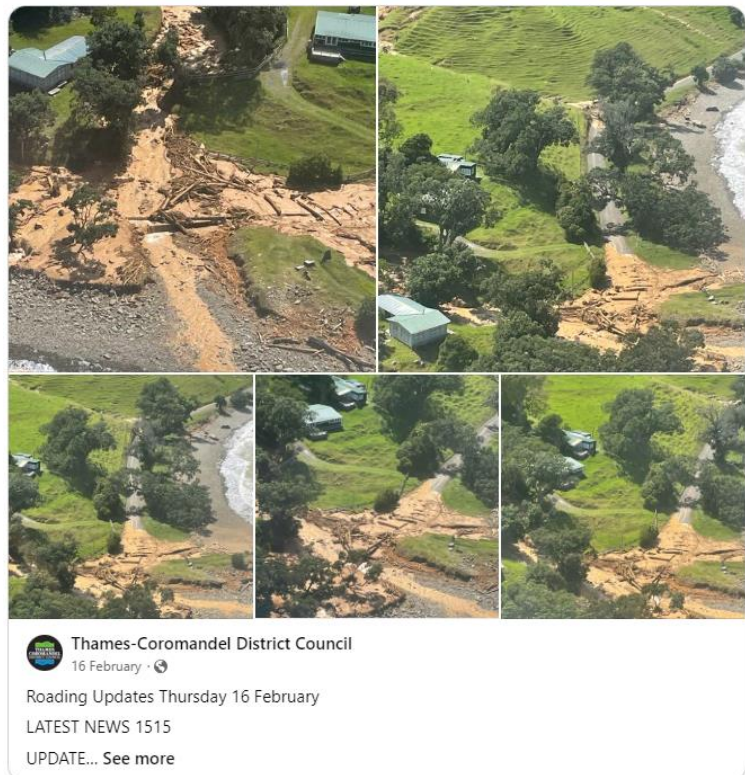


GNS is mandated to respond to natural hazard events

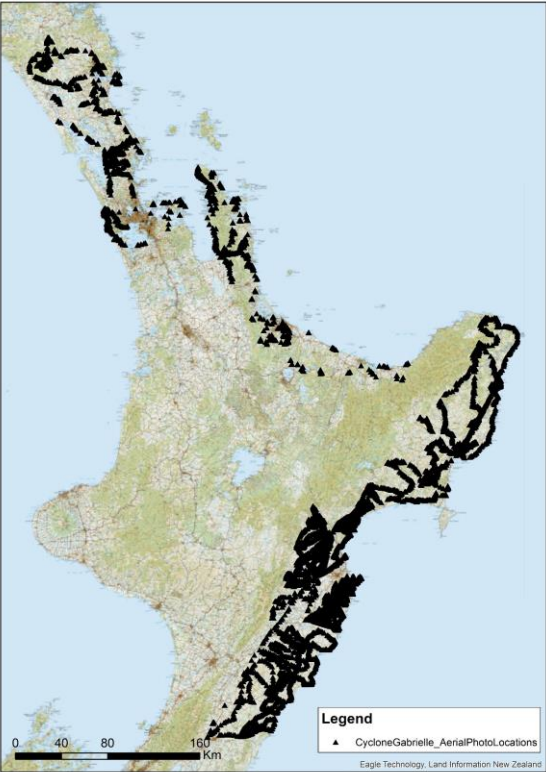
We aim to support the 4 Rs

We have set criteria to initiate responses

Typical Response:



Social media monitoring



Helicopter reconnaissance



Field investigations





## Ex-Tropical Cyclone Dovi - Dob in a landslide

Published: Mon Feb 14 2022 5:15 PM

Ex-Tropical Cyclone Dovi wreaked havoc across New Zealand over the weekend (12-13 February), with high winds, rain and damage across the country. Our thoughts are with those who were affected and with everyone working hard in the response and clean up.



B. Rosser

Home / New Zealand

## Cyclone Hale: East Coast resident crosses flooded river to get supplies



By [Akula Sharma](#)

14 Jan, 2023 01:04 PM · 4 mins to read

Save Share

July 2021

Nov. 2021

Feb.

Mar. 2022

July 2022

Jan.

Feb. 2023



Home News Radio Podcasts & Series Topics Pacific

New Zealand World Politics Pacific Te Ao Māori Sport Business Country Local Democracy Reporting

NEW ZEALAND / TE AO MĀORI

## Slip south of Gisborne destroys wāhi tapu and hopes of railway's reinstatement

7:34 am on 29 November 2021



Tom Kitchin, Hawke's Bay / Tairāwhiti Reporter

[@inkitchnz](#) [tom.kitchin@rnz.co.nz](mailto:tom.kitchin@rnz.co.nz)

Share this



Stuff.co.nz



B. Rosser

# Timeline







12.02.2023  
16.02.2023  
20.02.2023  
22.02.2023  
23.02.2023  
26.02.2023  
03.03.2023  
06.03.2023

**Cyclone Gabrielle**  
landslide dam forms

partial breach of dam

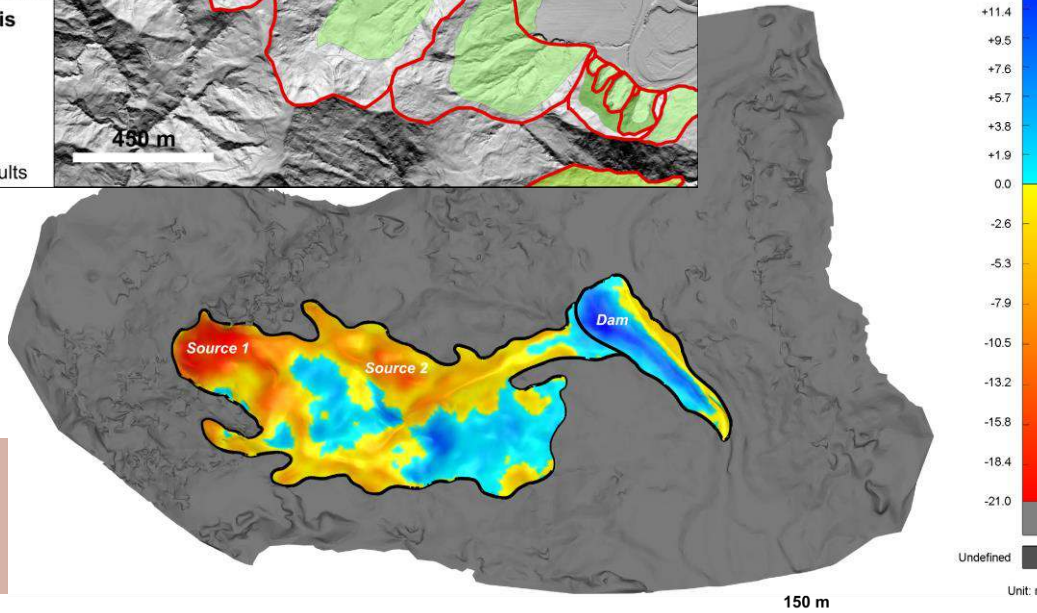
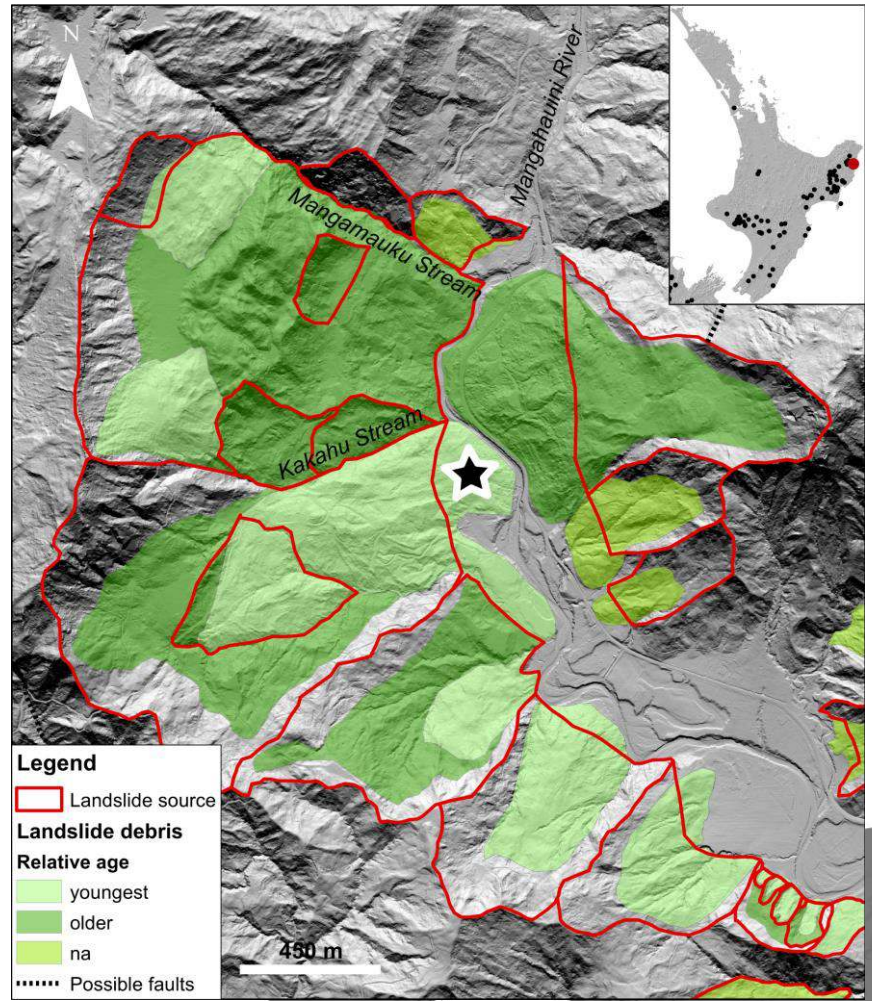
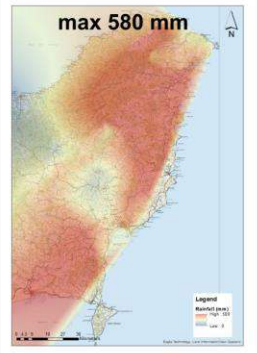
**GDC/GNS site visit**  
1st assessment  
1st breach models run (Stage 1a)

**64 Tokomaru Bay homes evacuated due to dam failure risk**  
Thu, Feb 23

breach models updated (Stage 1b),  
planning for survey

**GNS Survey of dam**

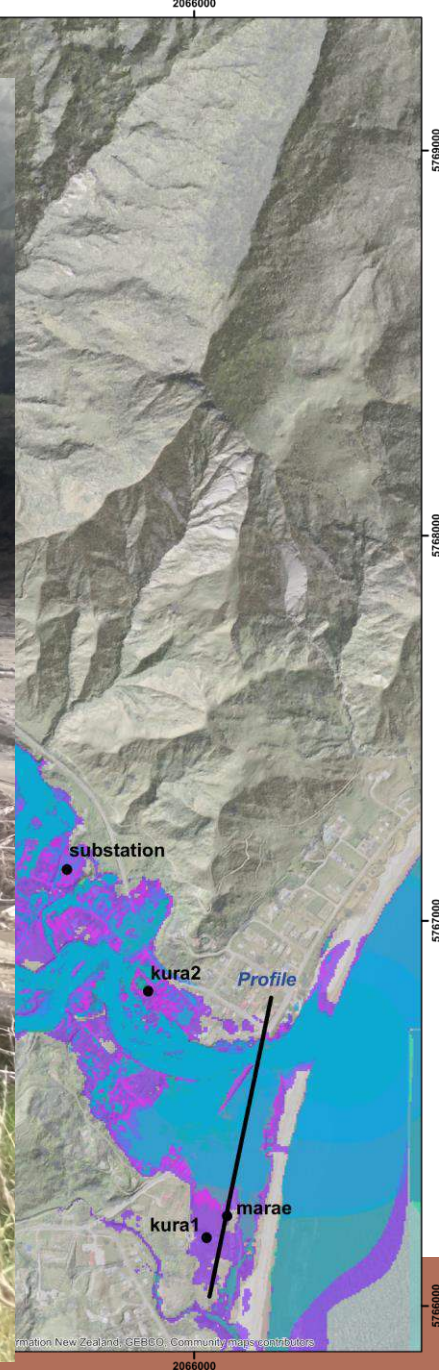
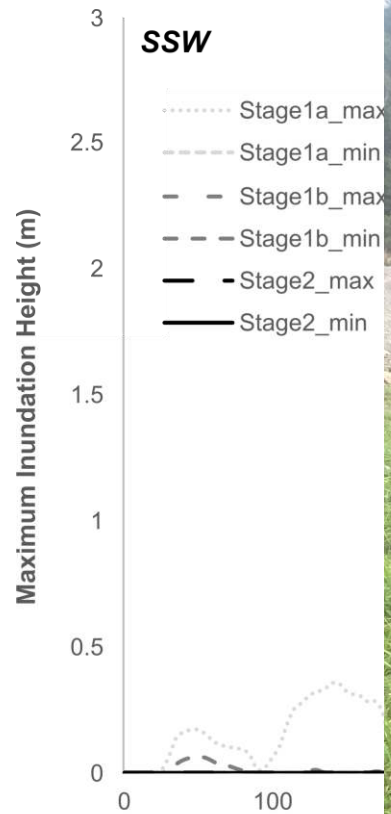
breach models updated (Stage 2),  
report drafted



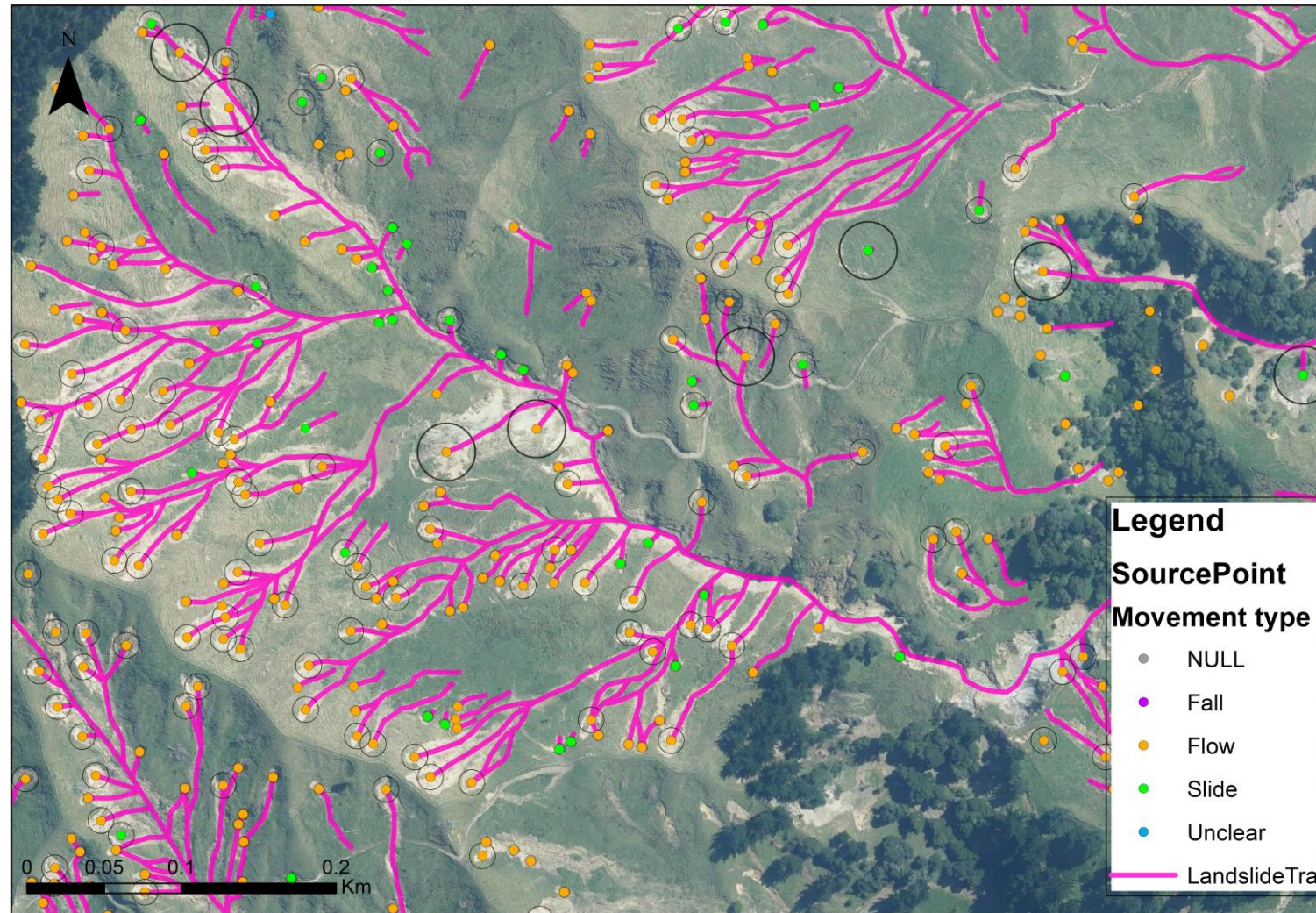
# Case Study



# Case Study



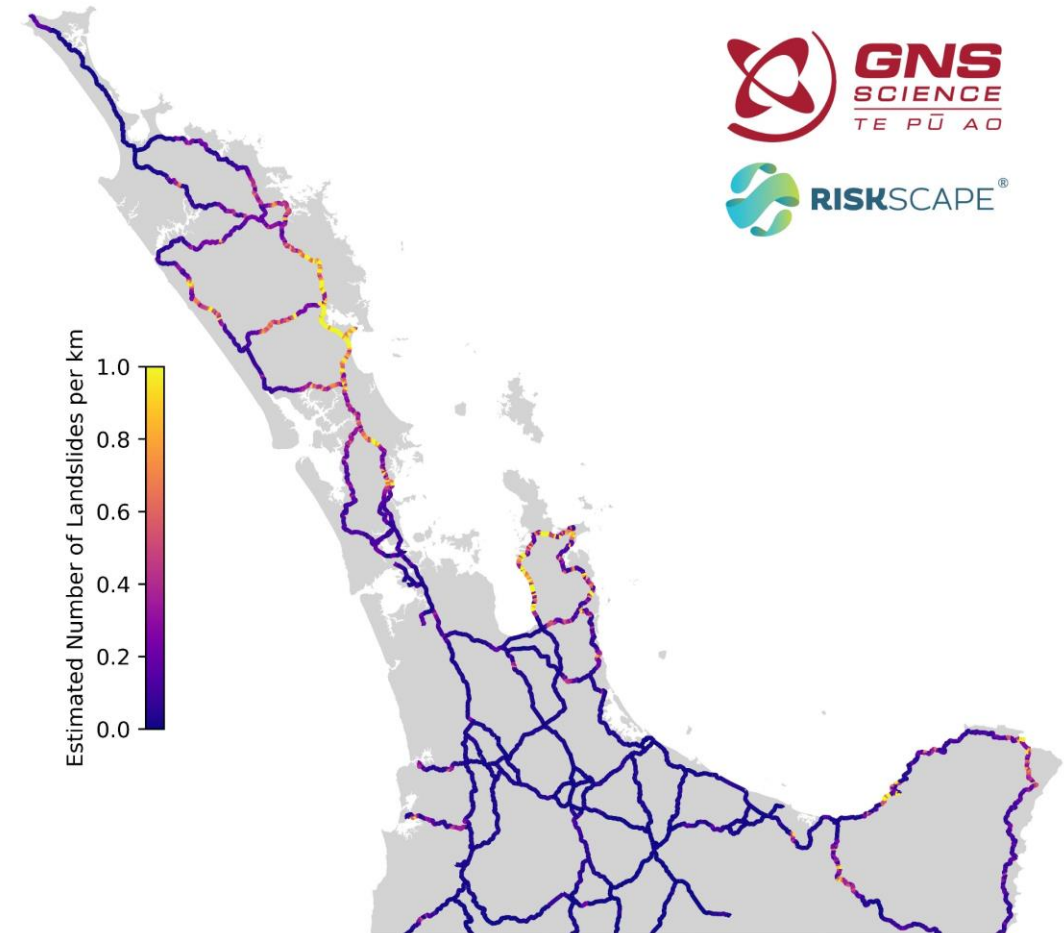
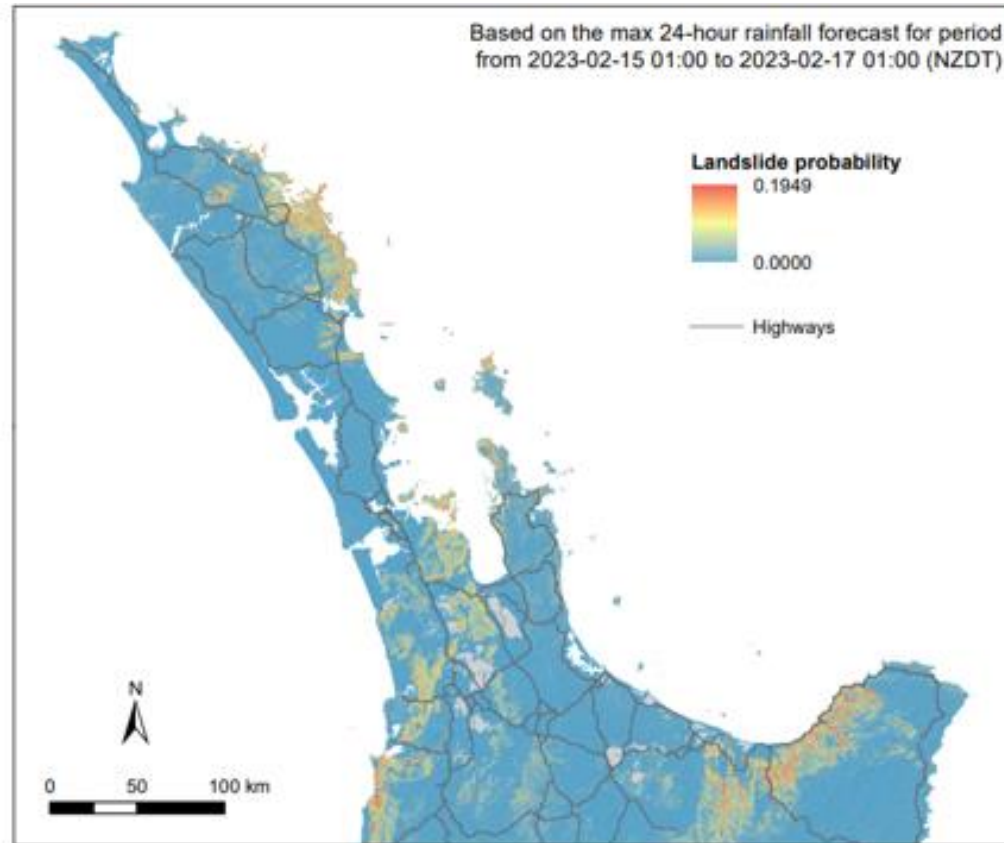




0.2 m resolution imagery, with mapped landslides shown as points and debris trails shown as lines

# Recovery – Large Responses





This data has been prepared by the Institute of Geological and Nuclear Sciences Limited (GNS Science) for its own internal purposes. The information contained in this data is derived from multiple data sources, including 3rd party data sources. As there is always uncertainty associated with such data, GNS Science gives no warranties of any kind concerning its assessment and estimates, including accuracy, completeness, timelines or fitness for purpose and accepts no responsibility for any actions taken based on, or reliance placed on them by any person or organisation. GNS Science excludes to the full extent permitted by law any liability to any person or organisation for any loss, damage or expense, direct or indirect, and however caused, whether through negligence or otherwise, resulting from any person or organisations use of, or reliance on the information contained in this data.

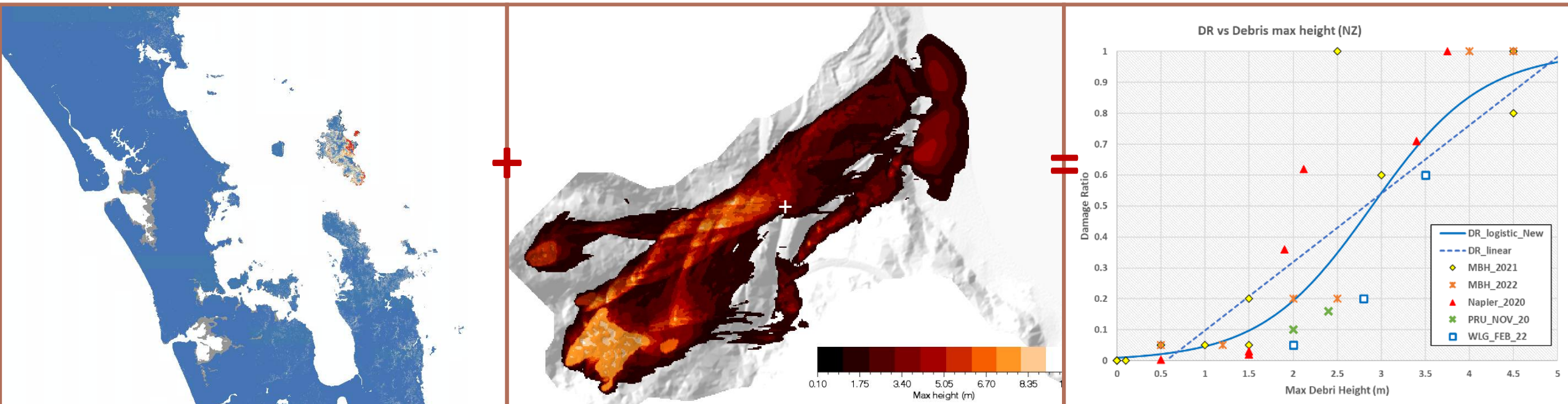
# Recovery and Beyond



- RNC2 research programme

**Field data** → **damage ratios** → **fragility functions**

$$DR = \frac{\text{cost to repair}}{\text{cost to replace}}$$



See Tech & Innovation Session at 3.30pm...

# Recovery and Beyond



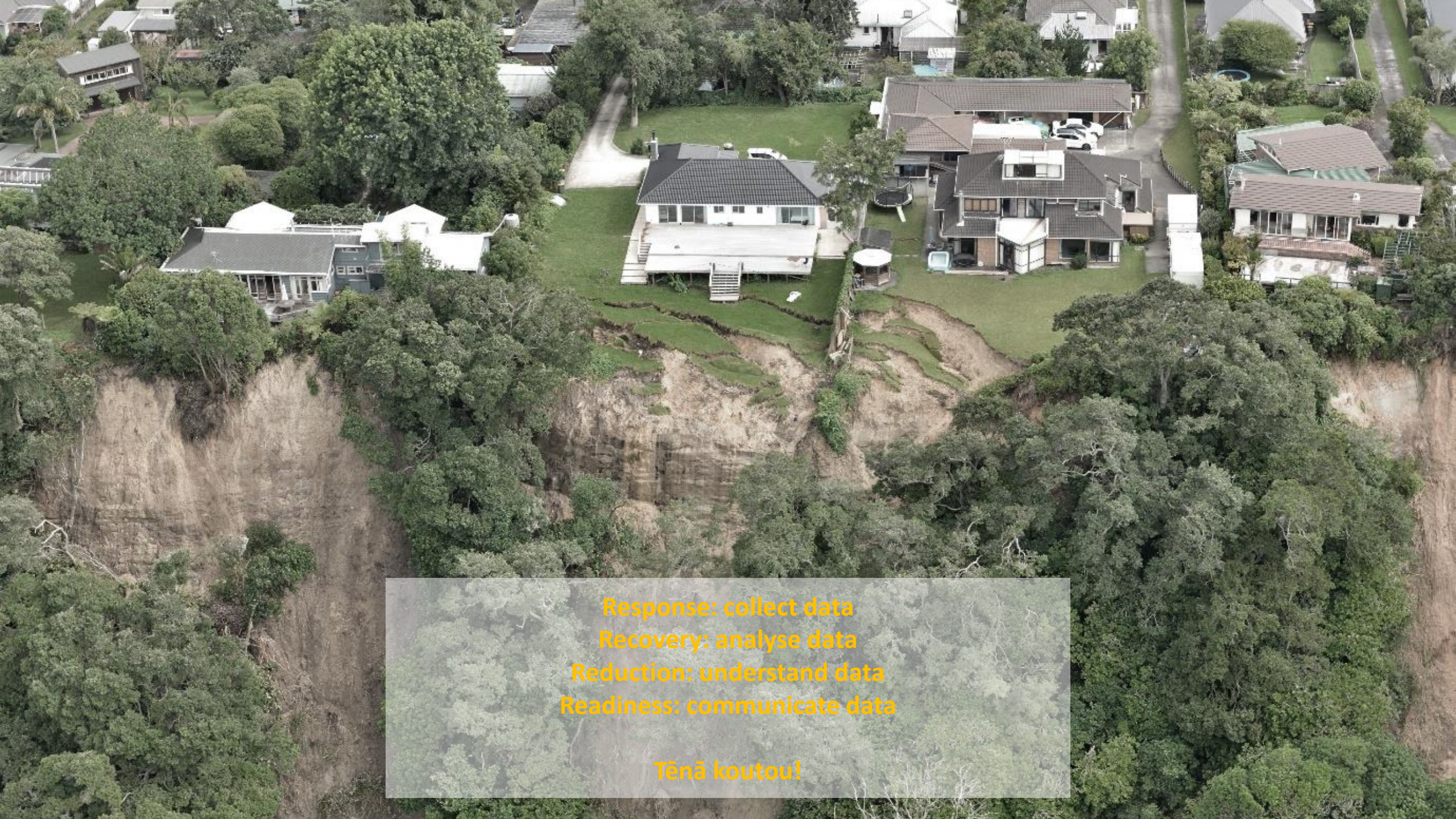
- I can only speak from my experience
- Science has done better at national level than community level
- More that GNS and other CRIs can do (science advisors on the ground)
- Still reactionary responses, not preparedness (NIMBY)
- Councils and Iwi have the hardest jobs!

***Thank You!***

Thoughts







Response: collect data  
Recovery: analyse data  
Reduction: understand data  
Readiness: communicate data

Tēnā koutou!



# Critical infrastructure: learning from past events

Liam Wotherspoon

RNC Symposium 2024





# Overview

Multiple events affecting critical infrastructure during RNC

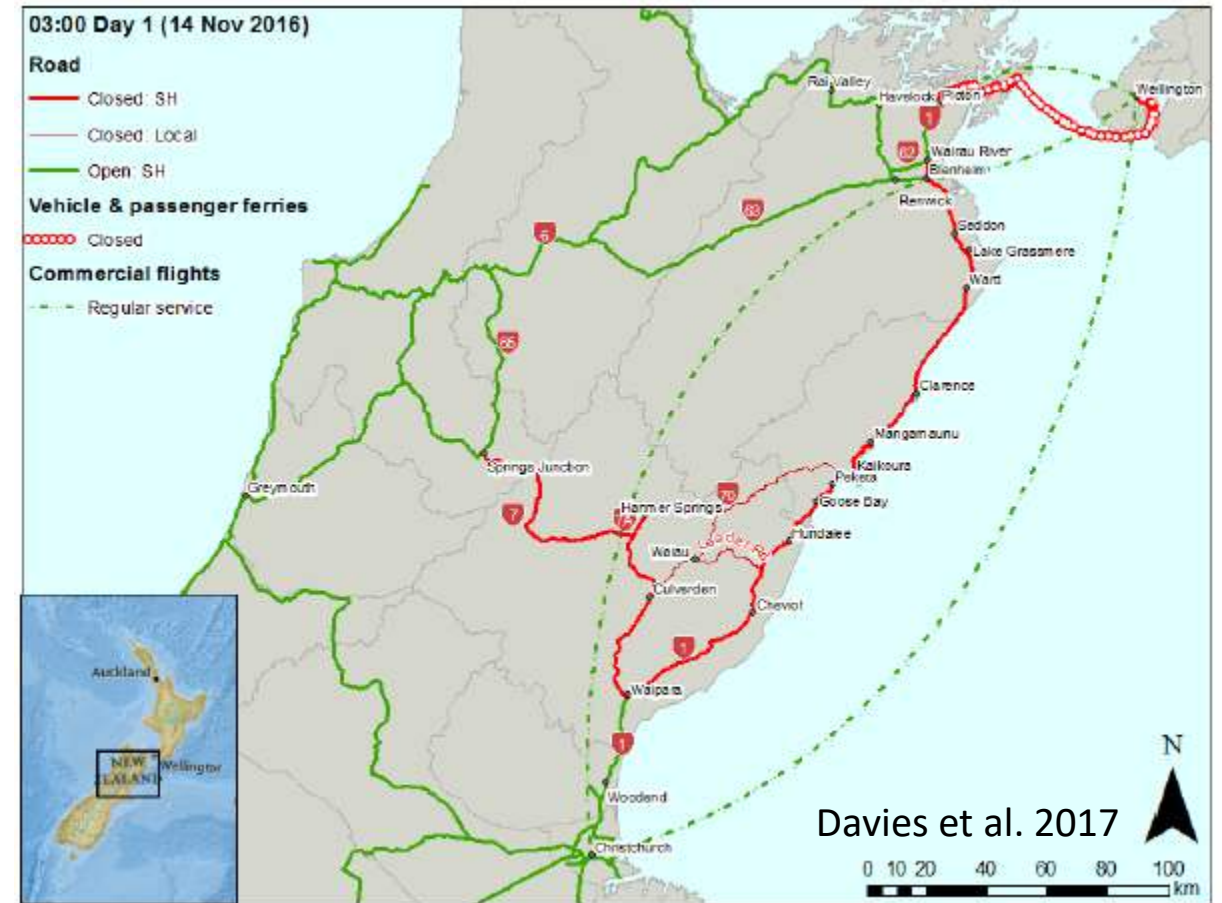
Highlighted different aspects of infrastructure performance and implications:

- Physical components
- System performance
- System dependencies
- Community impacts

Acknowledge huge range of people involved across research, practice and communities



# 2016 Kaikōura earthquake





# 2016 Kaikōura earthquake

## Research-practice response:

### IMPACT OF THE KAIKŌURA EARTHQUAKE ON THE ELECTRICAL POWER SYSTEM INFRASTRUCTURE

Yang Liu<sup>1</sup>, Nirmal-Kumar Nair<sup>1</sup>, Andrew Renton<sup>2</sup>  
and Stuart Wilson<sup>3</sup>

### RESILIENCE AND FRAGILITY OF THE TELECOMMUNICATION NETWORK TO SEISMIC EVENTS: EVIDENCE AFTER THE KAIKŌURA (NEW ZEALAND) EARTHQUAKE

Sonia Giovinazzi<sup>1</sup>, Andrew Austin<sup>2</sup>, Rob Ruiter<sup>3</sup>, Colin Foster<sup>4</sup>,  
Mostafa Nayyerloo<sup>5</sup>, Nirmal-Kumar Nair<sup>6</sup>  
and Liam Wotherspoon<sup>7</sup>

### TRANSPORT INFRASTRUCTURE PERFORMANCE AND MANAGEMENT IN THE SOUTH ISLAND OF NEW ZEALAND, DURING THE FIRST 100 DAYS FOLLOWING THE 2016 M<sub>w</sub> 7.8 “KAIKŌURA” EARTHQUAKE

Alistair J. Davies<sup>1</sup>, Vinod Sadashiva<sup>2</sup>, Mohammad Aghababaei<sup>3</sup>,  
Danielle Barnhill<sup>4</sup>, Seosamh B. Costello<sup>3</sup>, Briony Fanslow<sup>4</sup>,  
Daniel Headifen<sup>5</sup>, Matthew Hughes<sup>4</sup>, Rudolph Kotze<sup>5</sup>,  
Janelle Mackie<sup>6</sup>, Prakash Ranjitkar<sup>3</sup>, James Thompson<sup>6</sup>,  
Daniel R. Troitino<sup>5</sup>, Thomas Wilson<sup>4</sup>, Stuart Woods<sup>7</sup>  
and Liam M. Wotherspoon<sup>3</sup>

### IMPACTS OF THE 14<sup>TH</sup> NOVEMBER 2016 KAIKŌURA EARTHQUAKE ON THREE WATERS SYSTEMS IN WELLINGTON, MARLBOROUGH AND KAIKŌURA, NEW ZEALAND: PRELIMINARY OBSERVATIONS

Matthew W. Hughes<sup>1</sup>, Mostafa Nayyerloo<sup>2</sup>, Xavier Bellagamba<sup>3</sup>,  
Jonathan Morris<sup>4</sup>, Pathmanathan Brabhakaran<sup>4</sup>,  
Stephen Rooney<sup>5</sup>, Erica Hobbs<sup>5</sup>, Keith Wooley<sup>6</sup>  
and Steve Hutchison<sup>6</sup>



# 2016 Kaikōura earthquake

Lessons and relationships from the Canterbury earthquake sequence:

## **SCIENCE TO EMERGENCY MANAGEMENT RESPONSE: KAIKŌURA EARTHQUAKES 2016**

**Richard J. Woods<sup>1</sup>, Sara K. McBride<sup>1</sup>, Liam M. Wotherspoon<sup>2</sup>,  
Sarah Beavan<sup>3</sup>, Sally H. Potter<sup>1</sup>, David M. Johnston<sup>1</sup>,  
Thomas M. Wilson<sup>3</sup>, Dave Brunndon<sup>4</sup>, Emily S. Grace<sup>1</sup>,  
Hannah Brackley<sup>1</sup> and Julia S. Becker<sup>1</sup>**

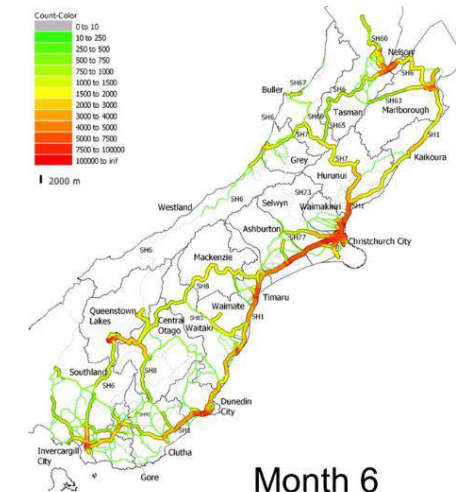
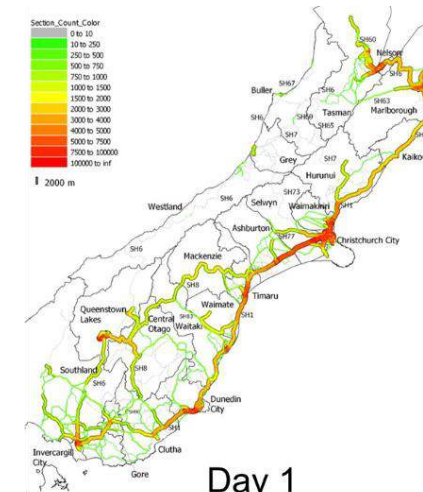
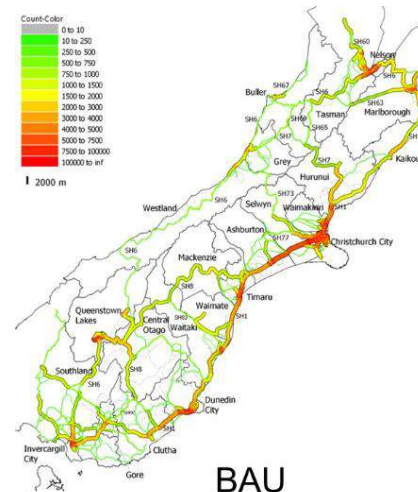
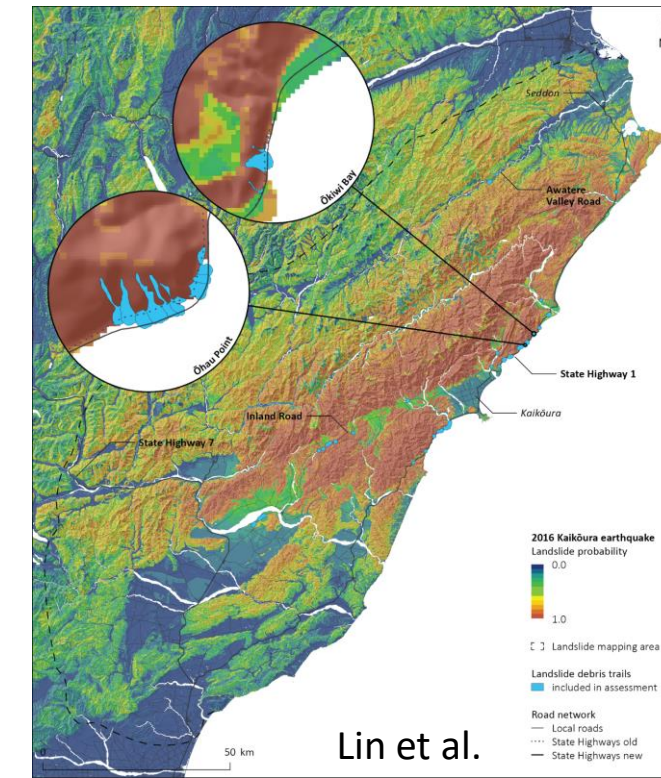
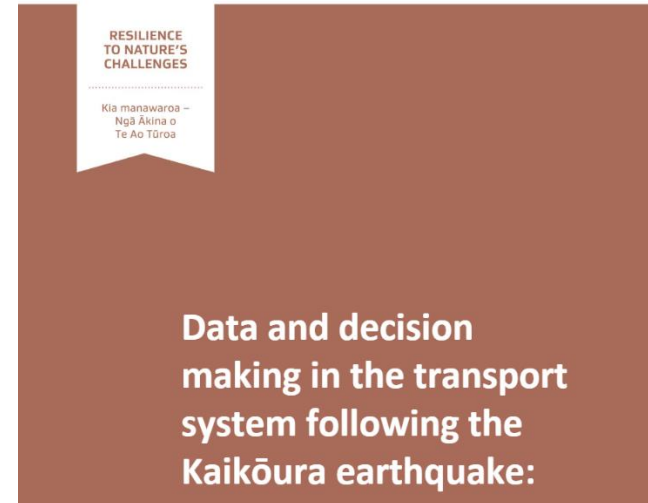


# 2016 Kaikōura earthquake

- Performance of components
- Lack of system redundancies
- Impact of landslides
- Vulnerability of freight systems
- Hazard cascades
- Component modelling
- Landslide models for infrastructure
- Transport system modelling
- Freight systems analysis
- Value of data

National  
**SCIENCE**  
Challenges

Wotherspoon et al.



RESILIENCE  
TO NATURE'S  
CHALLENGES

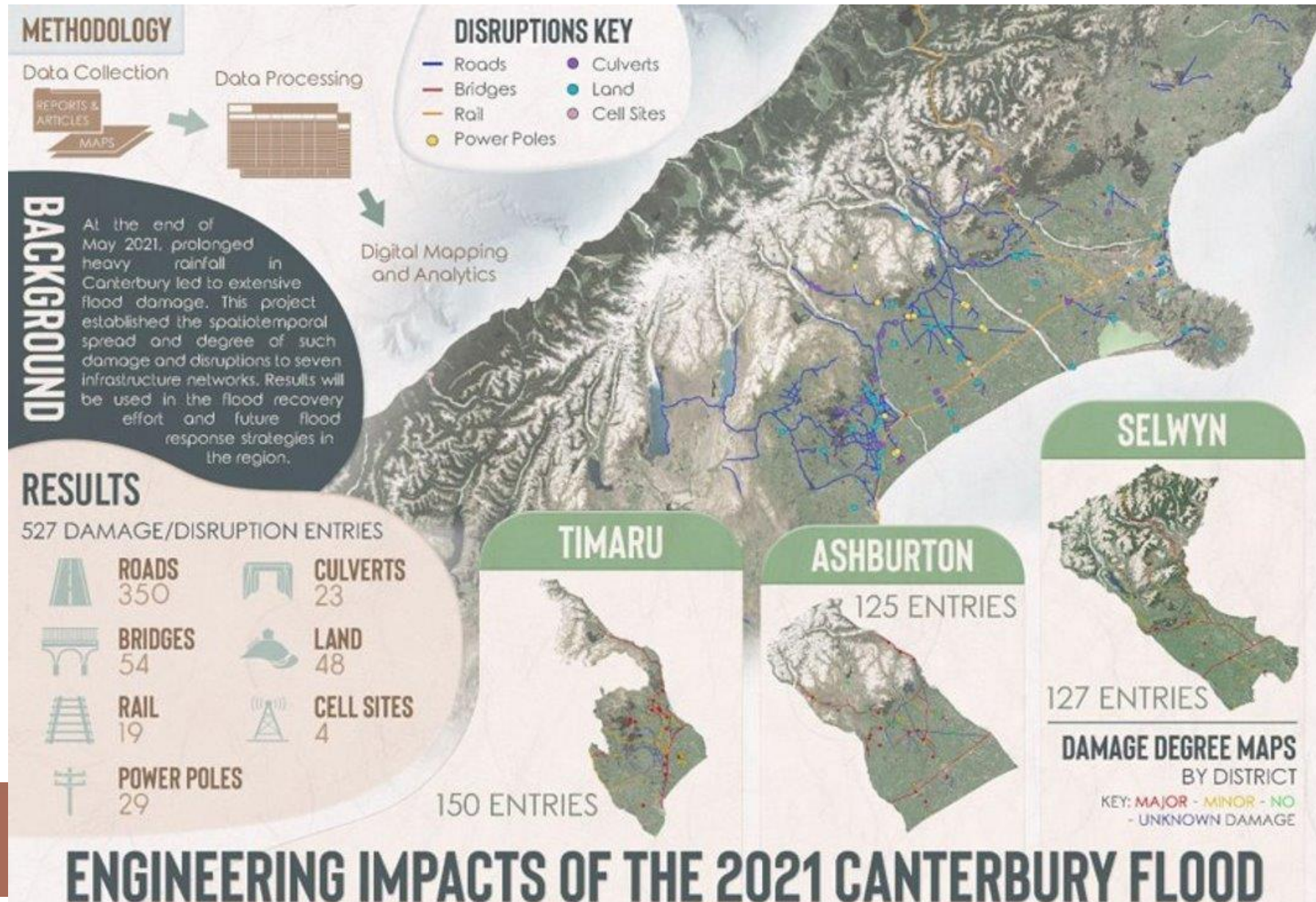
Kia manawaroa  
– Ngā Ākina o  
Te Ao Tūroa

National  
**SCIENCE**  
Challenges

Aghababaei et al.



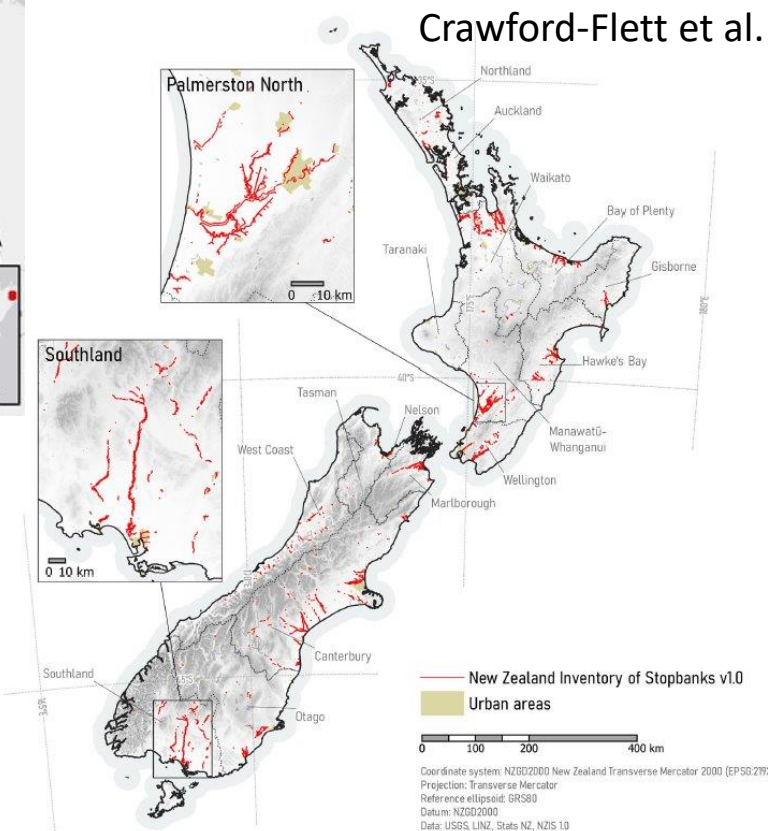
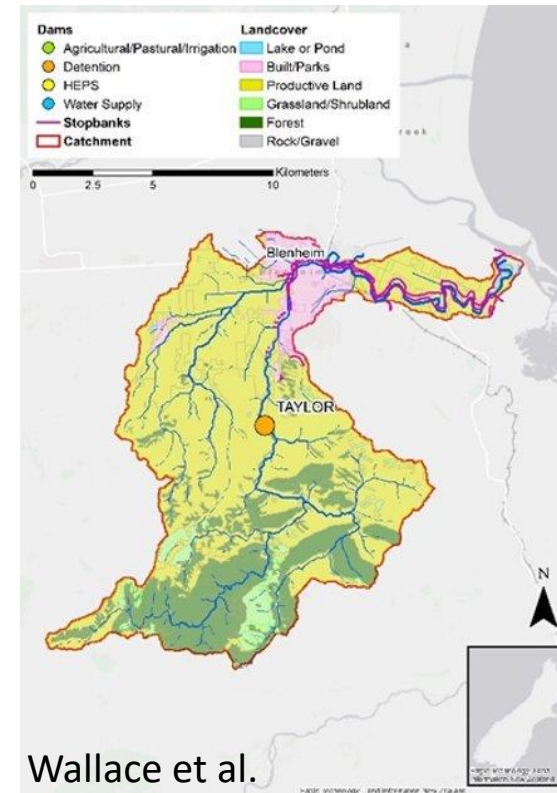
# 2019 - 2021 South Island Flood Events





# 2019 - 2021 South Island flood events

- Lack of system redundancies
- Vulnerability of flood defence networks & systems
- Infrastructure system modelling
- Flood defence network characterisation
- Catchment flood management analysis
- **Value of data**





# Auckland Floods & Cyclone Gabrielle 2023



RESILIENCE  
TO NATURE'S  
CHALLENGES

Kia manawaroa  
– Ngā Ākina o  
Te Ao Tūroa

National  
**Science**  
Challenges



# Auckland Floods & Cyclone Gabrielle 2023

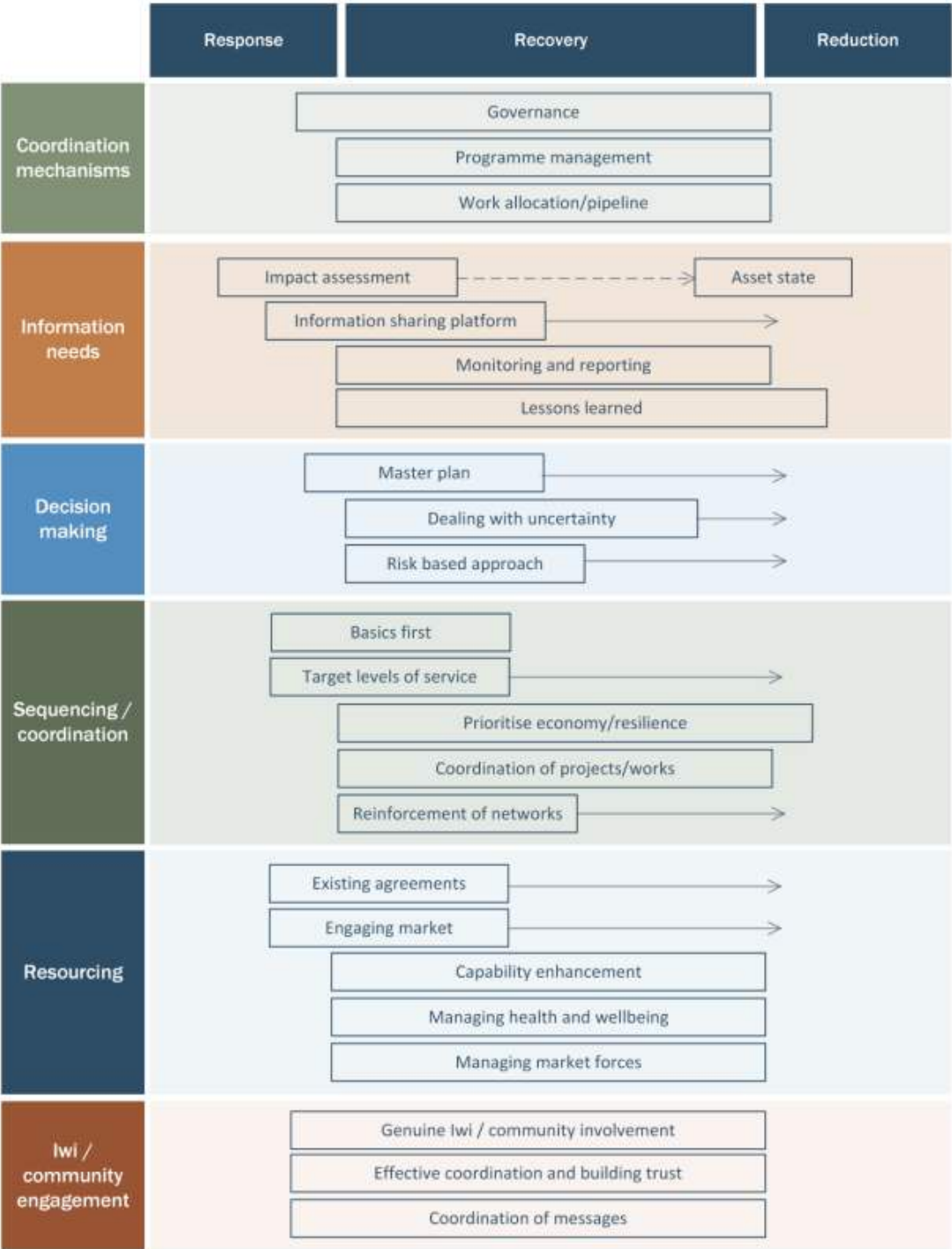
- Performance of components
  - Vulnerability of flood defence networks & systems
  - Lack of infrastructure system redundancies
  - Infrastructure system dependencies
  - Isolation of communities
  - Influence of technology
- 
- Extreme Weather Research Platform
  - Mā te haumarū ō te wai research programme
  - Hōretireti whenua research programme
- 
- **Value of data**



# Cyclone Gabrielle 2023

- Policy briefs:
  - Response and recovery lessons
  - Building resilience through recovery

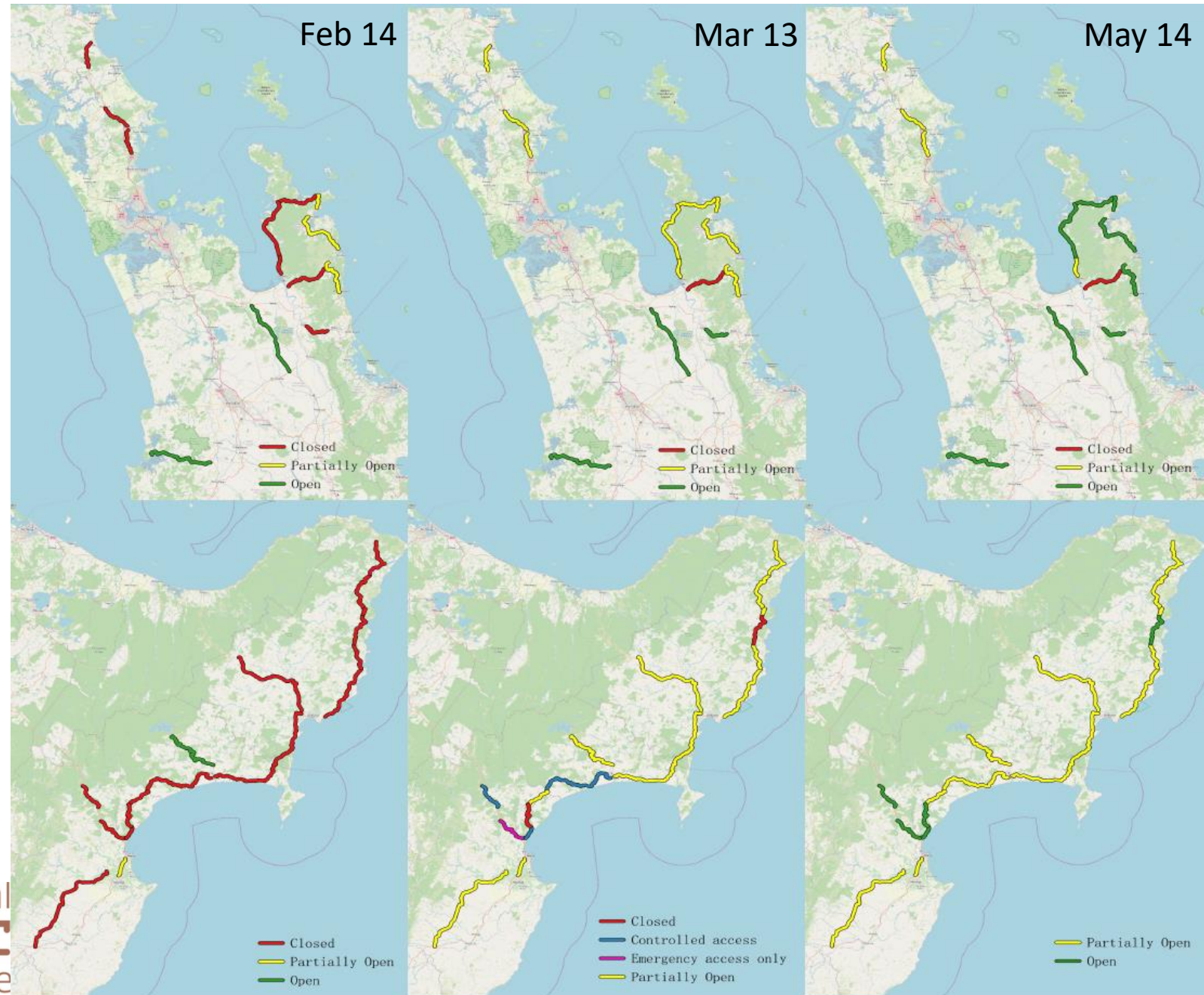
Mace & Brown 2023  
Curran & Brown 2023





# Cyclone Gabrielle

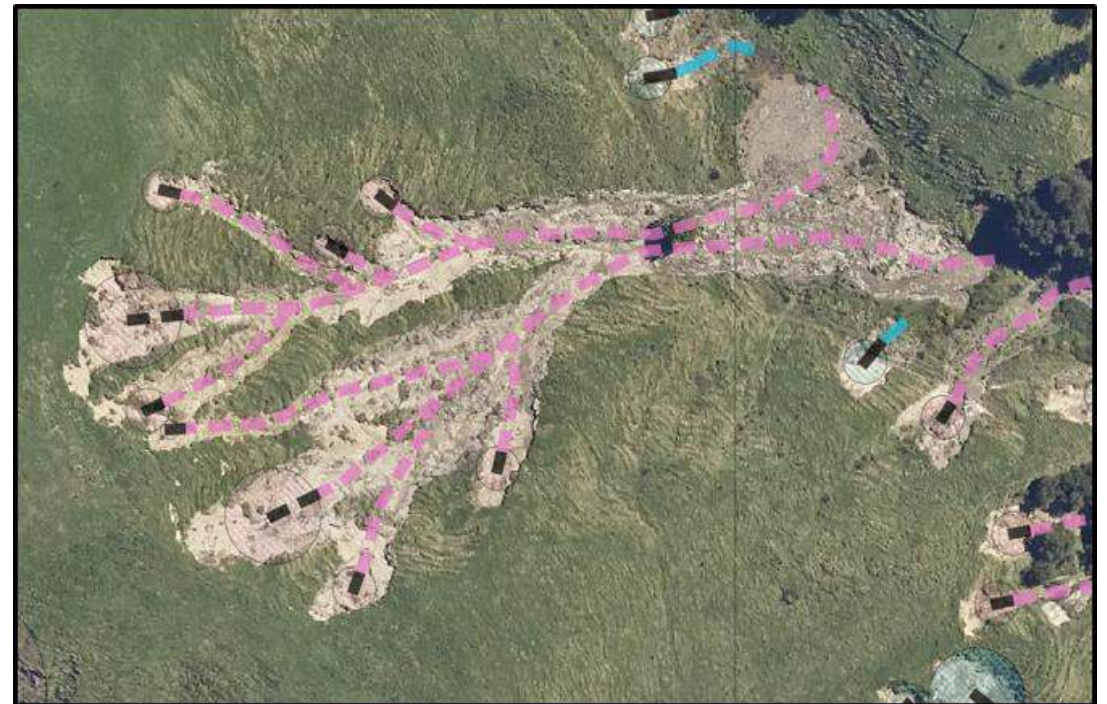
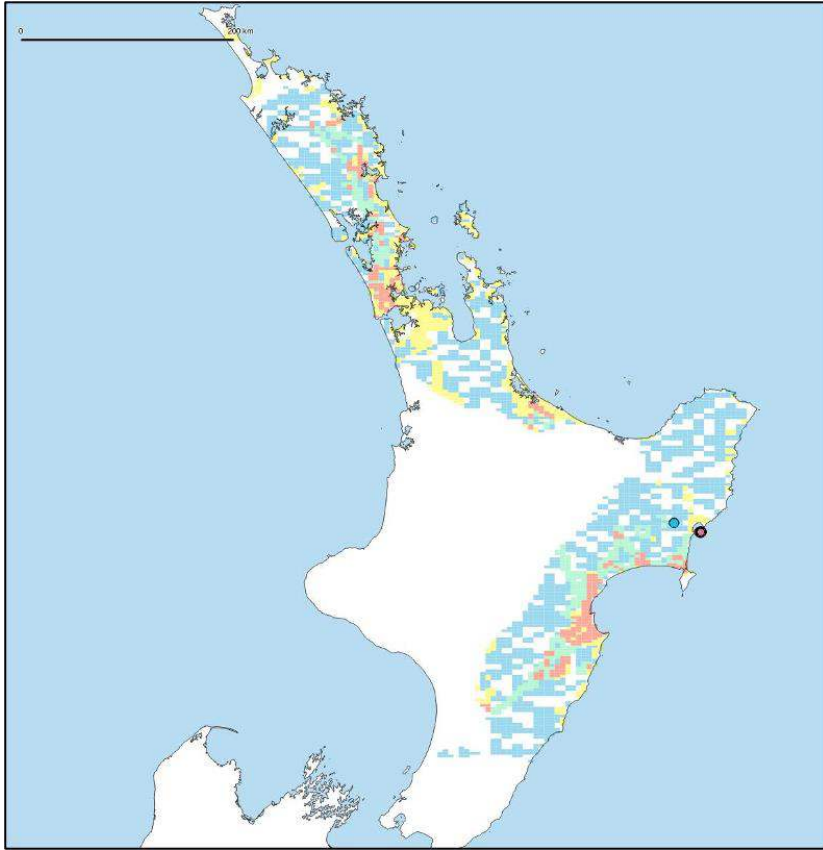
- Infrastructure recovery
  - Spatial
  - Temporal





# Cyclone Gabrielle 2023

- Landslide mapping





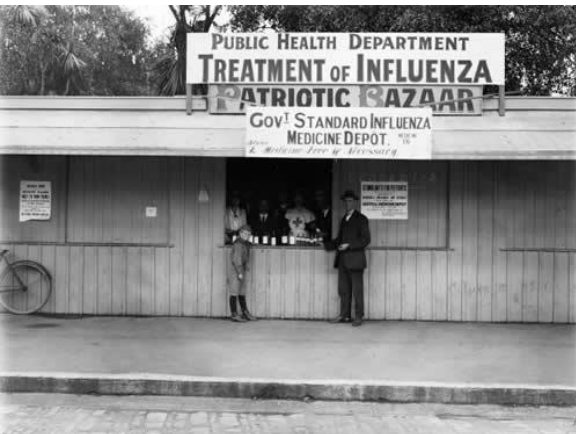
# Key Learnings

- Events of varying severity and extent highlight vulnerability of critical infrastructure
  - Lack of redundancies
  - Infrastructure dependencies
  - Isolation of communities
- During response and recovery
  - Importance of relationships and information sharing
  - Collaboration and coordination across research sector
  - Importance of data
- Research function before, during and after events
  - Support response to events and recovery
  - Use lessons and data to frame immediate and future research needs



# Historical context for past disasters and research lessons for EM system

David Johnston  
*Massey University*



National  
**SCIENCE**  
Challenges

RESILIENCE  
TO NATURE'S  
CHALLENGES

Kia manawaroa –  
Ngā Ākina o  
Te Ao Tūroa

 **MASSEY  
UNIVERSITY**  
TE KUNENGA KI PŪREHURŌA  
UNIVERSITY OF NEW ZEALAND



23 September 1995





# Observation 1

## Limited understanding of past events

1945

1996

RESILIENCE  
TO NATURE'S  
CHALLENGES

Kia manawaroa  
– Ngā Ākina o  
Te Ao Tūroa

National  
**Science**  
Challenges



## Observation 2

Limited understanding of appropriate lessons  
learnt methodologies (e.g. lack of appropriate connections between key players)





## Observation 3

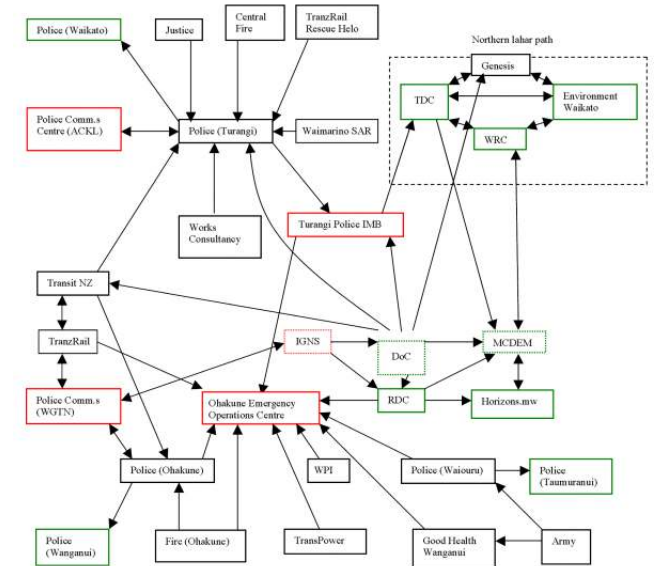
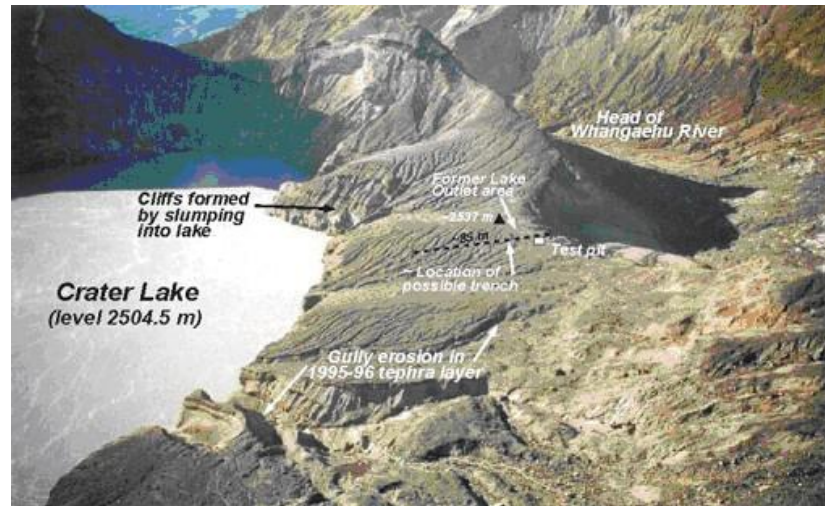
Limited understanding of the key elements for effective implementation of findings for system improvement





## Observation 4

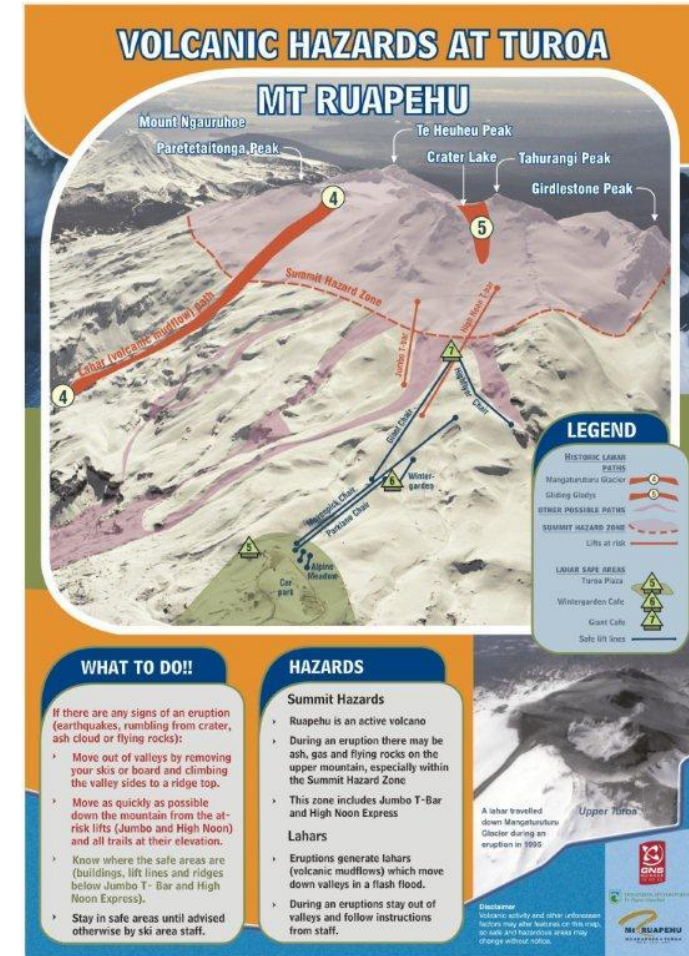
However, there are excellent examples at various scales of good practice.





# Observation 5

Opportunities to improve within the scope of the current EM and Science review processes.





# Learning From Past Events to Ensure Disaster Resilient Communities

Professor Christine Kenney  
Massey University  
Resilience to Nature's Challenges Final Symposium  
Te Papa, Wellington  
13 May 2024





# What Has Been Learned from Recent Disasters?

- Social and cultural capital, (personal networks and skills) influence disaster preparedness activities as well as access to resources post impact
- Those with the lowest socioeconomic capital tend to be disproportionately impacted in a disaster and tend to receive the least help and to a lesser standard.
- In a market model of recovery, vulnerable groups struggle to compete for necessary services creating inequities in adaptive capacity as well as in social and wellbeing outcomes over time.
- Effective disaster resilience planning requires consideration of how inequities create vulnerabilities prior to a disaster, to reduce risks which are then magnified post disaster through entrenched structural differences in access to resources





# The Case of Hurunui, Kaikōura and Wellington

- Inland rural communities in North Canterbury bore the brunt of the 2016 M7.8 earthquake.
- The District Councils established management teams to oversee local recovery responses. Ngāti Kuri opened their marae as a shelter and welfare hub.
- The effectiveness of local recovery initiatives was underpinned by access to resources and funding from the government, EQC and local agents e.g CDHB
- Yet media and policy makers appeared captured by the concerns of people affected in the urban areas of Wellington where:
  - Most urban residents were not displaced from their homes
  - Except for some parts of the Port of Wellington, local transport and utilities infrastructure remained intact,
  - Demolition of damaged buildings was negligible, and health and social services were not compromised
- In the aftermath of the Kaikōura earthquakes, government, local authority, private sector and scientific attention has intensified around future proofing the earthquake resilience of Wellington
- In contrast, Kaikāura and Hurunui saw significant delays in accessing essential mental health services, building inspections and economic support





# Review of Hawke's Bay Civil Defence and Emergency Management Group's response to Cyclone Gabrielle (2024)

“Formalisation of engagement with Taiwhenua, local marae and Māori communities to facilitate collaborative disaster readiness, risk mitigation, response and recovery planning is strongly recommended”.

“Formalised utilisation of indigenous knowledge and Kaupapa Māori approaches to land and water management and the 4 Rs”.

“...marae as distribution and welfare hubs throughout the region ...

“...that their role in the CDEM system is both appropriately resourced and clearly communicated to local communities”.

Report findings mirror observations and recommendations presented in reviews of past emergency management responses: the 2020 Covid pandemic, 2019 Nelson/Tasman Fires, & 2016 Kaikoura and 2010-2011 Canterbury earthquakes

## **No review recommendations are implemented... yet**

- Mātauranga Māori is an invaluable body of knowledge for informing resilience planning
- Māori hazard management approaches that are characterised by collective responsibility, authority, agency and action, are extremely effective at facilitating Māori and wider community resilience





# Successful Strategies for Preparing Diverse Communities for Catastrophic Hazard Events

- Collaborative partnerships ensuring DRR participation from all sectors of community and the risk reduction infrastructure “
- Valuing and drawing on Locals’ locale-specific knowledge when resilience planning
- Supporting community responders, agency and actions
- Responding to risks generated by geographical isolation
- Recognition at every level of the emergency management infrastructure that Māori knowledge, resources and operational capabilities are integral
- Prevent knowledge and resource siloing within, and between government departments and key resilience stakeholders





# DRR Science Support at Community, Local and National Levels

- DRR science support at every level is underpinned by reconceptualisation of disaster risks as systemic, complex, multifarious and contextualised
- DRR science must inform comprehensive but equally holistic risk assessments and mitigation measures
- DRR knowledge dissemination approaches should be varied, situated and fit for policy to facilitate science communication across diverse audiences
- Sustained capacity and capability within the DRR science workforce is necessary to ensure government and regional authorities have access to accurate and timely hazard risk and disaster resilience advice
- The science needs of communities, regional authorities and national actors (NZ, Govt) are temporally diverse, ranging from immediate, through to long term, and the science sector needs to respond accordingly.





# DRR science and Innovation Opportunities to enhance future risk management

- Centering DRR research on community, regional and national well-being
- Adopting multi-faceted risk assessment and mitigation measures e.g. dynamic and spatio-temporal multi-hazard risk assessment approaches, contextualised rapid impact assessments in acute situations
- Conducting longitudinal recovery research 'with' communities
- Extending multi-disciplinary, research-policy-practice collaborations for major natural hazard risks in partnership with diverse actors including iwi and other key Māori actors (e.g. FOMA)
- Creating permanent DRR science advisories with clear briefing mandates and direct communication with key decision makers
- Investing in 'new' DRR technologies research

