Navigating Seismicity: 

knowledge and insights on 

living with hazards and through disaster – 

Canterbury Earthquake Sequence 

2010/2011 

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Today’s EERI Presentation

i. Introduction
I. The Blithe Times: 2007-2010 pre-earthquakes
II. Waking up with a Tiger: 2010-2011 seismicity
III. Living with a Tiger: 8 practical realities
IV. Early Recovery: 2012-2013
V. Moving Forward: 2013-present day
VI. Takeaways for Cascadia
A 10-year Retrospective on Earthquakes and People in “The Shaky Isles” of New Zealand

- **PhD, Health Sciences (2006—2012)**
  University of Canterbury, Christchurch, New Zealand
2007: the New Zealand Riskscape
The Blithe Times
Preparedness & Resilience Research
2007-2010
**Aims:** Examining associations among health-related quality of life, well-being, and preparedness behavior

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<th>Concept</th>
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Survey Administration


- Self-complete questionnaire posted to households
- Sampling Frame
  \( n = 6312 \)
- Sample Size
  \( n = 2451 \)
- Response Rate
  \( n = 695 \) (28.5%)
- Margin of error \( \pm 3.8\% \)
- 80% power \( r \geq 0.11 \)
Results

- **Correlational analyses**
  - **Positive associations with evacuation preparedness**
    - Spiritual, emotional, and global well-being
    - Increasing age (?)
  - **Negative associations**
    - Physical health status
  - **No association**
    - Mental health status, social well-being, gender

- **Regression analyses**
  - Overall health and well-being explained 4.6-6.8% of the variance in evacuation preparedness behavior
  - **Spiritual well-being (meaningfulness)** is the only QoL variable that significantly and uniquely explained variance in preparedness
Publications

Results Paper

  - Available via Open Access at www.hqlo.com/content/12/1/85

Policy Debate Paper

4 September 2010
M7.1 Darfield, New Zealand – 10 km deep

Image courtesy: Jaiswal, Kishor (USGS) via personal communication
22 February 2011
M6.3 Port Hills, New Zealand – 5 km deep

Image courtesy: Jaiswal, Kishor (USGS) via personal communication
13 June 2011
M6.3 Sumner, New Zealand – 6 km deep

Image courtesy: Jaiswal, Kishor (USGS) via personal communication
Peak Ground Accelerations

22 Feb 2011

13 June 2011

Images courtesy: GNS Science, Lower Hutt
M5.8 aftershock
23 December 2011
(view from Clifton across Sumner to Scarborough Head)

M5.7 aftershock
14 February 2016
(Scarborough Head)
The ever-changing zeitgeist

- 4 Sept 2010
  “Feeling lucky”

- 22 Feb 2011
  Shock, horror, grief, suffering

- 13 June 2011
  “Is the world ending?”

- 23 Dec 2011
  “When will it be over?”
Life 101: Adversity brings profound changes, prolonged challenges, and opportunities

Adversity introduces a man to himself. 

Albert Einstein

“I am not what happened to me, I am what I choose to become.”

—Carl Gustav Jung
Living with a Tiger
Finding growth through trauma
"When next? How big? How long? How violent?"

Practical Question: *What’s my Event Management Plan?*

The Subtext (practical reality):
*How does one manage and prevent the primitive basic instinct from taking over the intellect?*
Earthquake Events:
Foreshocks, Mainshocks, and Aftershocks
Things are fluid

Practical Question: *What’s my day-to-day, hour-by-hour plan?*

The Subtext (practical reality):
*How do I plan for uncertainty?*
Closures, detours, utility breakdowns

Image Sources: M. Gowan
Keep Calm and Carry On

Practical Question: *What’s my best next step?*

The Subtext (practical reality):
*Acting “as if...”*
NOW PANIC AND FREAK OUT

KEEP CALM AND CARRY ON
"Maintain (don’t lose) the Plot"

Practical Question: *What’s my perseverance strategy?*

The Subtext (practical reality):

*The need to take the long view – everything is temporary*
From “Shag Rock” to “Shag Pile”

Dawn, July 2007

Dawn, July 2011

Image Sources: M. Gowan
Look after each other, look after yourselves

Practical Question: What are my Best-care Practices? For myself? For others?

The Subtext (practical reality): Well-being starts with kindness
“Mateship”
Roll with it

Practical Question: *How to maintain lightness of being?*

“*Treat all disasters as if they were trivialities but never treat triviality as if it were a disaster*”

– Quentin Crisp
“Rock and Roll”

Image Source: M Gowan

“Roll with It” video

https://www.youtube.com/watch?v=qtnUNysHT5c

Image Source: Kahuna Kidsong
Christchurch: sure to rise

Practical Question: *How to maintain hope and optimism?*

The Subtext (practical reality): *Enduring deconstruction*
When a City Falls: From the streets of Christchurch – the People’s Story (2011)

Feature length documentary by Gerard Smyth.
Official trailer at:
http://www.nzfilm.co.nz/film/when-a-city-falls
Honoring heritage
Lifting spirits

Image Courtesy: Steve and Sara Dobbs
2013-2017
Early Recovery
Leave-taking and observations from afar
“Everything takes a long time”

Practical Question: *What is a reasonable expectation?*

The Subtext (practical reality):

*Recovery is a long haul*
The Red Zone: CBD
How do we get our work done?
Public Health Messaging

Image Source: Canterbury DHB allright.org.nz
Strengths Assessment Tool


What are Canterbury’s strengths?

#1 KINDNESS
1406 times a top 5 strength
2017

Going Forward

Acknowledging, memorializing, and rebuilding
From road hazard to remembrance
From Red Zone to parkland – liquefaction in Christchurch, NZ then and now

Image credit: Jon Mitchell

Image credit: Kate Pedley & Pat Bodger

Image credit: Jon Mitchell
Mourning the lost

Image Source: M Gowan
Canterbury Earthquake National Memorial

We Remember
February 22, 2011
Oi Manawa

“Tremor of the Heart”

KIA ATAWHAI KI TE IWI.

CARE FOR THE PEOPLE.

PITA TE HORI, UPOKO —

NGĀI TŪĀHURIRI RŪNANGA, 1861.

Images courtesy: Brigid Kelly
Take-aways
Living with Cascadia Risks
Personal Event Readiness

On me

- Whistle
- Flashlight (phone)
- iPad Nano (AM/FM radio)
- I.C.E. contact information
- Address book
- Notepad & pen
- Cash

In my Getaway Bag

- What would you take in your carry-on for a long-haul flight?
  - Shower kit
  - Knickers and socks
  - Waterproof shell
  - Stuff sack/travel backpack
  - Device chargers
  - Important documentation
  - + other go-kit items
Day-to-day Needs Planning

- Have a breakfast plan!
- Have a shower plan
- Have a laundry plan
- Have a respite plan
- Have a fun plan!

Image Source: M. Gowan
Acknowledgments

- Ray Kirk, University of Canterbury School of Health Sciences
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- Kate Pedley, University of Canterbury Department of Geological Sciences

Thank you!

Further questions or comments?
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LinkedIn: www.linkedin.com/in/drmonicaegowan
Sand liquefaction
Christchurch, New Zealand

https://www.youtube.com/watch?v=8mEI1wf89LM
Aftershocks on intersecting fault planes