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The use of GIS in assessing spatial variations in stress-related health as a result of living in seismically active Christchurch, New Zealand

Prof Simon Kingham

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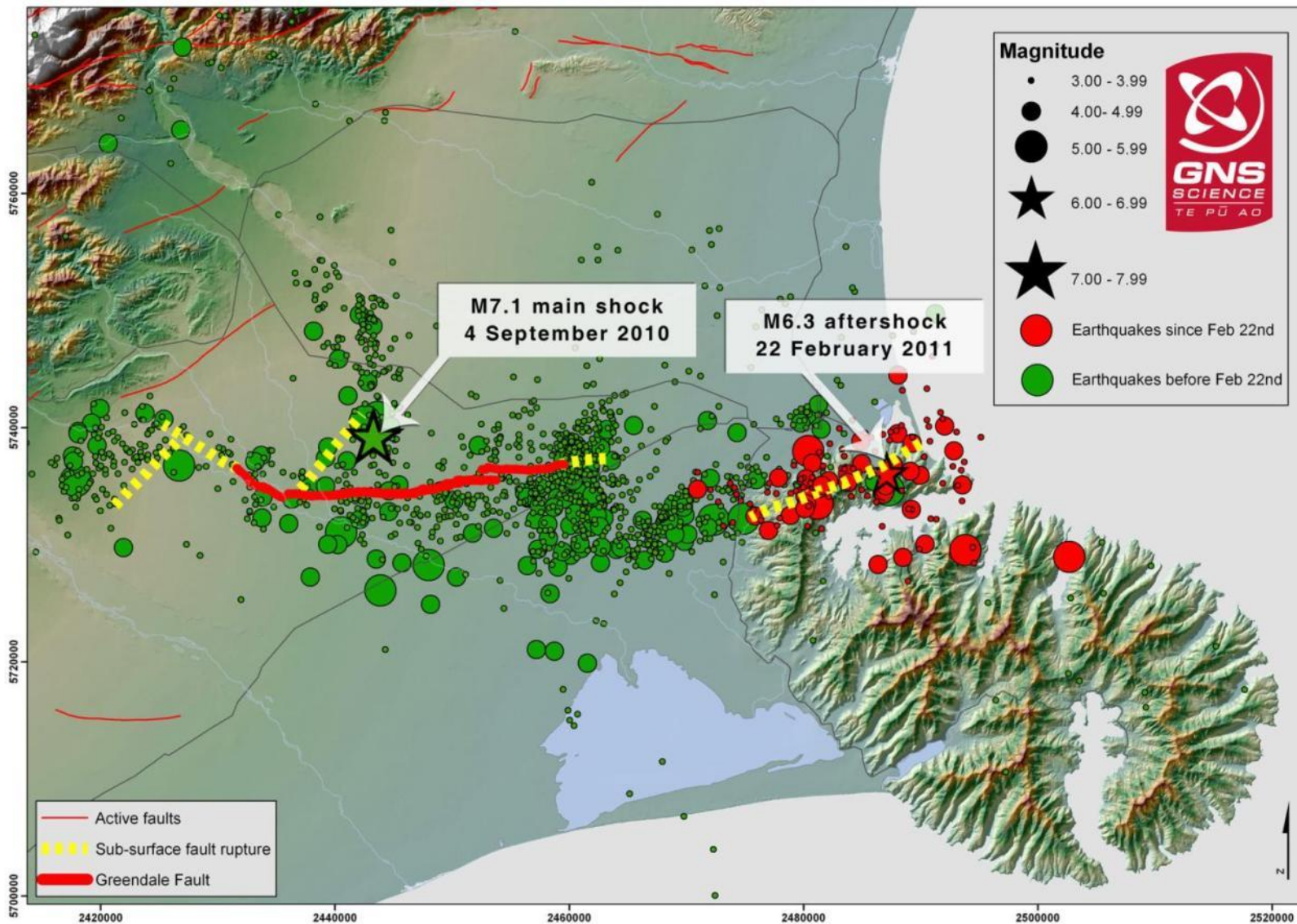
Christchurch, New Zealand



- Cooperative Research Centre for Spatial Information (CRCSI)
 - *... a government, industry and research joint venture ... using spatial technologies to solve complex problems of national significance ...*
 - Australia and New Zealand
 - www.crcsi.com.au/Research/4-4-Health/4-43-Geographic-variations-in-natural-disaster
- PhD scholarship



- Major earthquakes in and around Christchurch, New Zealand, since September 2010

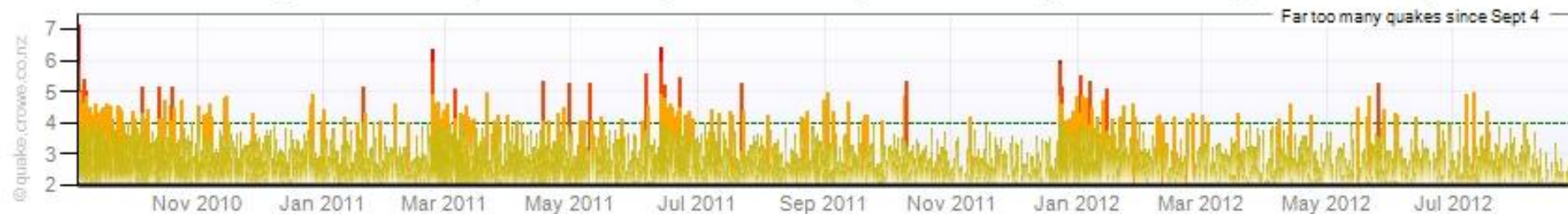




- Ongoing seismic activity



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Mag	Last Shake	Shakes
<u>1</u>	23/08/2012 7:32pm	<u>84</u>
<u>2</u>	28/08/2012 11:48am	<u>8142</u>
<u>3</u>	19/08/2012 10:19am	<u>3196</u>
<u>4</u>	16/07/2012 4:15pm	<u>420</u>
<u>5</u>	25/05/2012 2:44pm	<u>52</u>
<u>6</u>	23/12/2011 3:18pm	<u>3</u>
<u>7</u>	04/09/2010 4:35am	<u>1</u>
Total quakes		11898

www.canterburyquakelive.co.nz



- Major damage
 - 70% of city centre to be demolished



- 15,000-20,000 residential properties to be rebuilt
- Over 100,000 properties to be repaired



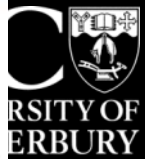
- Ongoing (*years*) community impact
 - Facilities permanently or temporarily closed
 - schools, shops, GPs
 - *Temporary* housing arrangements
 - Smaller housing, garages, even cars
 - Community break up & geographical challenges
 - Dispersal/Relocation of whole communities
 - *Red zone* area not to be rebuilt
 - Uncertainty over state of land and rebuild
 - Red, orange, green, white etc.



- Immediate health impacts
 - Injuries, fatalities
- Medium term impacts
 - Sanitation
 - Liquefaction dust
- Ongoing health impacts
 - Stress related

Suicide numbers drop after quake

ANTONIO BRADLEY



Last updated

World cup and quakes cause drop in suicide rate

SARAH HARVEY

Last updated 05:00 01/01/2012

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**MMP REVIEW
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Health

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- [Fewer Kiwis drinking liquor](#)
- [Dying baby sent home three times](#)
- [I don't regret it - man who helped mum die](#)
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- [Life with an autistic child](#)
- [Son labelled 'medical burden' so no residency](#)
- [Agents 'trick' nurses into signing bonds](#)
- [Rest homes tackle racism with 'cultural evenings' for residents](#)
- [Home crisis threatens health 'tsunami'](#)

Suicides almost ceased during the Rugby World Cup, in a phenomenon linked to that seen in the aftermath of the Christchurch earthquakes, the London bombings and the September 11 attacks.

Community Action on Suicide Education Prevention and Research (Casper) founder Maria Bradshaw said in the aftermath of the London bombings, the September 11 attacks and the Christchurch earthquake there was a reduction in suicides.

She said suicides often occurred when people felt marginalised, so it made sense there was a drop when there was "social cohesion".

"Suicide occurs because people have a lack of sense of belonging, and a sense that they don't make a valued contribution. So, when you have things like the earthquake and the cup, people who are feeling like that suddenly have something in common with everyone else," Bradshaw said.

Stress still elevated in quake aftermath

Christchurch men battling depression

Hard grind as quakes take toll on

Land woes 'harming mental health'

MICHAEL WRIGHT

Last updated 12:05 20/08/2012  28  Like  0  5  Tweet  3  +1   Share

Christchurch Earthquake 2011

[lets clear the air.co.nz](http://lets.clear.theair.co.nz)

-  [Quake freedom idea worth spreading](#)
-  [Live music bonanza for volunteers](#)
-  [Southland project to assist Chch rebuild](#)
-  [Housing squeeze hits rebuild](#)
-  [Advocates to help speed recovery for hardest-hit](#)
-  [Key services' quake response to be studied](#)
-  [Civil Defence back in central Christchurch](#)
-  [Costs likely to bar small firms from CBD](#)

Insurance and land-zoning concerns are affecting the mental health of Cantabrians trying to recover from the earthquakes, a psychologist says.

Ron Chambers, of the Canterbury District Health Board, said there were a few "hiccups" in people's reactions to the quakes that broke from the usual pattern for disaster response.

"The difficulty and the difference here is that we've been faced with many thousands of aftershocks which have complicated that recovery process and ... we've had to deal with [issues] around land zoning and ... insurance," he said.

"The unclarity around a whole lot of things like that really have had an ongoing impact on people's stress levels and resilience and ability to move forward."



- Is there a spatial relationship between the extent of physical damage from natural disasters and non-injury psycho-social stress related health outcomes ?
- Are adverse stress-related health outcomes greater among people who have experienced greater physical damage to their communities and homes than other those who have experienced less damage, but who also live in the city?



- Estimate *exposure* to seismic damage/impact
 - extent of home damage
 - infrastructure service closures and restriction
 - community disruption e.g. school & shop closure
 - amount & extent of liquefaction
 - magnitude of *shaking*
 - changing land *colour*



- Point health data
 - patients *attending* hospital emergency department
 - Plus, those *admitted* to hospital
 - callers to Healthline
 - ACC earthquake claims
 - Health survey respondents



- Tracking geography of individuals from diagnosed to before the start of the seismic activity in Sept 2010
 - Postal re-direction information collected by the Post Office
 - Data from insurance companies on address changes



- Determining exposure to earthquake-related anxiety and stress
- Track mobile populations through the environment
- Relate earthquake *exposure* to health outcome



- Me
 - Professor of Geography & Director of Geohealth Laboratory



- PhD student
 - To be appointed



- Professor Mike Ardagh
 - Professor of Emergency Medicine, CDHB



- Dr Tom Wilson
 - Lecturer in Hazards & Disaster Mgmt

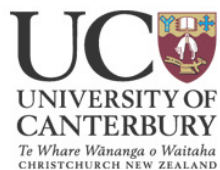


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NZ Research team



- Dr Greg Breetzke
 - Senior Lecturer in GIS



- Dr Elena Molchanova
 - Lecturer in spatio-temporal statistics



- Dr Sonia Giovinazzi
 - Research fellow in GIS and Hazards

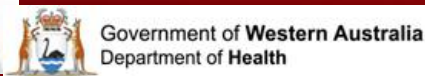
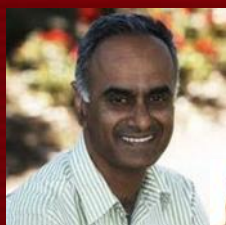
Overseas Research team



- Narelle Mullen
 - CRC·SI/Curtin University



- Prof James Semmens
 - Curtin University/CRC·SI



- Dr Tarun Weeramanthri
 - WA Dept of Health



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Questions

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