

# IRISS

## INCREASING RESILIENCE IN SURVEILLANCE SOCIETIES

### **Deliverable D6.1 – A report on resilience in “democratic” surveillance societies**

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Wieczorek, Arnold, "Schülerattentate an deutschen Schulen. Mythen, Fakten und Schlussfolgerungen für die polizeiliche Praxis", *Kriminalistik*, Vol. 64, 2010, pp. 153ff.

### 3.2.7 2011 Christchurch earthquake

*Charles Leleux, University of Stirling*

#### **Nature of the adverse event**

Located on the South Island of New Zealand, and sitting within the Canterbury region, the city of Christchurch (population: 341,000) is the country's second largest city.<sup>459</sup> Originally inhabited by the indigenous Maori populations, the first Europeans were thought to have settled in what became Christchurch in the early 1840s, with their original trades being whaling and farming.<sup>460</sup> The Mw6.3 earthquake which hit Christchurch unexpectedly and catastrophically on 22 February 2011 at 12.51 killed over 180 people, injured a further 1500-2000, and was in fact an aftershock of a previous earthquake (Mw7.1) occurring on 4 September 2010 which resulted in no fatalities.<sup>461</sup> The Canterbury Television (CTV) building which collapsed resulted in the loss of 115 lives. After the earthquake on 22 February 2011 it was estimated that 800 business premises in the central business district (CBD), where most of the fatalities occurred, plus 10,000 domestic properties would require to be demolished, and that the economic costs of repairing the damage would be in the region of US \$11-15 billion.<sup>462</sup> Most of the fatalities were caused by soil liquefaction leading to lateral movement of buildings, tilting of buildings, falling masonry and collapse of both reinforced and unreinforced buildings.<sup>463</sup> An extensive study of the performance of masonry buildings and churches was commissioned in March 2011, i.e. the month following the earthquake, by the New Zealand Natural Hazards Research Platform, and recommendations from the subsequent report later that year, included "appropriate seismic retrofit and remediation techniques for stone masonry

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<sup>459</sup> Statistics New Zealand, 2013 Census of Population and Dwellings. <http://www.stats.govt.nz/Census/2013-census/data-tables/population-dwelling-tables.aspx>

<sup>460</sup> Christchurch City Council, "History". <http://www.christchurch.org.nz/about/history.aspx>

<sup>461</sup> Reyners, Martin, "Lessons from the destructive Mw 6.3 Christchurch, New Zealand, earthquake", *Seismological Research Letters*, Vol. 82, No. 3, 2011, pp. 371-372.

<sup>462</sup> Ibid.

<sup>463</sup> Cubrinovski, Misko, Jonathan D. Bray, Merrick Taylor, Simona Giorgini, Brendon Bradley, Liam Wotherspoon, and Joshua Zupan, "Soil liquefaction effects in the central business district during the February 2011 Christchurch earthquake", *Seismological Research Letters* Vol. 82, No. 6, 2011, pp. 893-904.

buildings”.<sup>464</sup> A Royal Commission was also established to investigate the reasons for building failure, due to the two earthquakes, and sat between 2011 and 2012, making various recommendations regarding the future preparation of regional and district plans, and the need for greater involvement of structural engineers and geotechnical surveys at the planning stages of applications for construction projects. The main difference between the Christchurch earthquakes of September 2010 and February 2011, was that the former event occurred out with the CBD area, and although very powerful and causing much damage, the epicentre of the latter event was fairly close to the CBD, causing many buildings to collapse with subsequent loss of life.<sup>465</sup>

Awareness amongst public bodies of the likelihood of ground movements and earthquakes in this area was high, although the September 2010 and February 2011 earthquakes occurred on fault lines which the authorities were not aware of, occurring on “.....previously unknown fault lines in a region of historically low seismicity but within the zone of plate boundary deformation between the Pacific and Australian plates”.<sup>466</sup> Pettinga et al, record that there are around ninety major earthquake source faults around the Canterbury region, which includes Christchurch, and characterise these faults according to “type (sense of slip), geometry (fault dimensions and attitude) and activity (slip rates, single event displacements, recurrence intervals, and timing of last rupture)”.<sup>467</sup> Pettinga et al also provide an historical account of earthquakes taking place in Christchurch and the wider Canterbury region, notably those taking place in 1869, 1870, 1888, 1902, 1922, 1929 and 1994.<sup>468</sup> Various regional, national and international monitoring systems were already recording on a daily basis, any changes in ground conditions and seismological activity, and various modelling techniques were also in use to predict the likelihood and frequency of such a major event taking place.<sup>469</sup> The Christchurch earthquake of 22 February 2011, which was not predicted by the scientific community (although there were significant ground movements recorded), was the worst to hit New Zealand since the Hawkes Bay earthquake in 1931.<sup>470</sup> The Mw7.8 earthquake which took place on 2 February 1931 at Hawkes Bay on the North Island, severely damaged two towns, Napier and Hastings, and resulted in the loss of 256 lives, with the surrounding area suffering

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<sup>464</sup> Dizhur, Dmytro, Jason Ingham, Lisa Moon, Mike Griffith, Arturo Schultz, Ilaria Senaldi, Guido Magenes et al, “Performance of masonry buildings and churches in the 22 February 2011 Christchurch earthquake”, *Bulletin of the New Zealand Society for Earthquake Engineering*, Vol. 44, No. 4, December 2011, pp. 279-295.

<sup>465</sup> Ibid.

<sup>466</sup> Beavan, John, Eric Fielding, Mahdi Motagh, Sergey Samsonov, and Nic Donnelly, “Fault location and slip distribution of the 22 February 2011 Mw 6.2 Christchurch, New Zealand, earthquake from geodetic data” *Seismological Research Letters*, Vol. 82, No. 6, 2011, pp. 789-799.

<sup>467</sup> Pettinga, Jarg R., Mark D. Yetton, Russ J. Van Dissen, and Gaye Downes, “Earthquake source identification and characterisation for the Canterbury region, South Island, New Zealand”, *Bulletin of the New Zealand National Society for Earthquake Engineering*, Vol. 34, No. 4, 2001, pp. 282-317.

<sup>468</sup> Ibid.

<sup>469</sup> Cubrinovski, Misko, Jonathan D. Bray, Merrick Taylor, Simona Giorgini, Brendon Bradley, Liam Wotherspoon, and Joshua Zupan, “Soil liquefaction effects in the central business district during the February 2011 Christchurch earthquake”, *Seismological Research Letters*, Vol. 82, No. 6, 2011, pp. 893-904.

<sup>470</sup> Kaiser, A., C. Holden, J. Beavan, D. Beetham, R. Benites, A. Celentano, D. Collett et al, “The Mw 6.2 Christchurch earthquake of February 2011: Preliminary report,” *New Zealand Journal of Geology and Geophysics*, Vol. 55, No. 1, 2012, pp. 67-90.

aftershocks and further earthquakes in the weeks and months following.<sup>471</sup> The extent to which the local community, local agencies and national bodies demonstrated their resilience both prior to and following the event on 22 February 2011 including the use of any surveillance technologies, is examined in the following sections.

### **Institutional response**

In the immediate aftermath of the earthquake on 22 February 2011 responsibility for control of the areas affected fell to John Hamilton, the Director of Civil Defence Emergency Management,<sup>472</sup> who established communications with the National Crisis Management Centre in Wellington, the local Civil Defence and Emergency Management Group in Christchurch, and Christchurch City Council. The Ministry of Civil Defence and Emergency Management responded quickly by issuing a fairly short but purposeful media release at 15.30 on 22 February (only two hours and forty minutes after the earthquake struck). The media release advised people on where the earthquake was centralised; the operational status of Christchurch hospital and the airport, plus made suggestions about keeping cellphone usage to a minimum as the network was struggling due to heavy demand from people trying to contact loved ones; avoiding travelling by road unless absolutely necessary, and encouraging people to keep updated by listening to local radio and Radio New Zealand.<sup>473</sup> Further advice was also provided in the same media release about personal safety in and around the home, paying particular attention to utility services, including links to various websites. The Ministry of Civil Defence and Emergency Management issued additional media releases on 23 February providing a Red Cross Person Enquiry Helpline, and on 24 February on how to make cash donations to help people affected by the disaster:

The Ministry of Civil Defence & Emergency Management is stressing that cash donations are the best way to support people affected by the Canterbury earthquake.<sup>474</sup>

The New Zealand Government declared a State of National Emergency on 23 February 2011; this lasted for nearly nine weeks. The Government also acted with impressive speed in passing the Canterbury Earthquake Recovery Act 2011 on 18 April 2011 less than two months after the event, the purposes of which included not only the physical rebuilding of properties and infrastructure, but also the rebuilding of social capital:

- (a) to provide appropriate measures to ensure that greater Christchurch and the councils and their communities respond to, and recover from, the impacts of the Canterbury earthquakes
- (b) to enable community participation in the planning of the recovery of affected communities without impeding a focused, timely, and expedited recovery

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<sup>471</sup> Eiby, G. A., “An annotated list of New Zealand earthquakes, 1460–1965”, *New Zealand Journal of Geology and Geophysics*, Vol. 11, No. 3, 1968, pp. 630-647.

<sup>472</sup> Ministry of Civil Defence & Emergency Management. <http://www.civildefence.govt.nz/>

<sup>473</sup> Ministry of Civil Defence & Emergency Management. [http://www.civildefence.govt.nz/memwebsite.nsf/wpg\\_URL/Media-Media-release-archive-Index?OpenDocument](http://www.civildefence.govt.nz/memwebsite.nsf/wpg_URL/Media-Media-release-archive-Index?OpenDocument)

<sup>474</sup> Ibid.



- (c) to provide for the Minister and CERA (Canterbury Earthquake Recovery Agency) to ensure that recovery
- (d) to enable a focused, timely, and expedited recovery
- (e) to enable information to be gathered about any land, structure, or infrastructure affected by the Canterbury earthquakes
- (f) to facilitate, co-ordinate, and direct the planning, rebuilding, and recovery of affected communities, including the repair and rebuilding of land, infrastructure, and other property, and
- (g) to restore the social, economic, cultural, and environmental well-being of greater Christchurch communities.<sup>475</sup>

CERA<sup>476</sup> was established by the New Zealand Government through the Canterbury Earthquake Recovery Act 2011 shortly after the earthquake to work closely with other agencies, such as regional, city and district councils, and in particular Christchurch City Council (CCC).<sup>477</sup> Primary responsibilities of CERA included governance; infrastructure coordination and planning; planning and deconstruction of buildings (jointly in many cases with CCC); economic recovery coordination; skills and workforce planning, and welfare rebuild coordination. A formal Cost Sharing Agreement was also put in place between the Crown and CCC. The extent to which tensions emerged between the various agencies, and in particular CERA and CCC, in the course of inter-agency working, is examined under the section ‘Economic Response’.

The Canterbury Earthquakes Royal Commission was established to report on the causes of building failure as a result of the earthquakes as well as the legal and best practice requirements for buildings in New Zealand Central Business Districts. The Inquiry began in April 2011 and was completed in November 2012. The Chair of the Royal Commission, Justice Mark Cooper gave the following commitment to those affected by the disaster, “Those who lost relatives and friends in the 22 February earthquake can be assured that there will be a very thorough inquiry into the failure of buildings that resulted in loss of life”.<sup>478</sup>

The Royal Commission produced their report in three parts, with some of the key recommendations including: regional and district plans to be prepared on the basis that they acknowledge the potential effects of earthquakes and liquefaction; regional and district authorities to be adequately informed about seismicity of their regions and districts; applicants must ensure geotechnical and structural engineering information is provided from professionally qualified persons, and greater powers for councils to ensure the involvement of structural engineering experts in the planning application process.

## **Societal Response**

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<sup>475</sup> New Zealand Parliament, Canterbury Earthquake Recovery Act 2011. <http://legislation.govt.nz/act/public/2011/0012/latest/DLM3653522.html?src=qs>

<sup>476</sup> CERA, Canterbury Earthquake Recovery Agency. <http://cera.govt.nz/about-cera/roles-and-responsibilities>

<sup>477</sup> Christchurch City Council. <http://ccc.govt.nz/Content/Search/SearchResults.aspx?query=christchurch+earthquake&btnG=Search>

<sup>478</sup> Canterbury Earthquakes Royal Commission. <http://canterbury.royalcommission.govt.nz/>

Turning firstly to the argument that society perhaps contributed in some way to the effects of the Christchurch disaster of 22 February 2011, it could not reasonably or justifiably be claimed that the city and its surrounding environment were formed in a place which is susceptible to such an event, and therefore society could be blamed in part for the consequences of this naturally occurring event. As outlined in the previous section, although there were numerous known geological faults in the wider Canterbury region, with several recorded earthquake events occurring in the previous century, and with daily monitoring of ground conditions taking place, the two earthquakes which took place in September 2010 and February 2011 occurred on geological fault lines which were unknown to the scientific community. The catastrophic earthquake which occurred on 22 February 2011 caused damage, destruction and fatalities on a scale unrecorded in Christchurch previously, did so despite the seismological technology at the disposal of the scientific community.

Regarding the resilience of the built environment, it is clear from studies which have been undertaken that it was not sufficient enough to withstand the effects of the earthquake, in particular in the CBD. Both reinforced and unreinforced office buildings collapsed or were damaged as a result of which people lost their lives. In particular, the Canterbury Television building (CTV) which collapsed, resulted in the loss of 115 lives. The technical study commissioned by the New Zealand Natural Hazards Research Platform involved an international team of scientists who documented and interpreted the destruction and damage to over 2000 buildings which were both reinforced and unreinforced, including churches, commercial and domestic properties. They investigated the failure patterns and collapse mechanisms that were commonly encountered, and found unsurprisingly that unreinforced buildings sustained far greater damage than reinforced ones. The findings concluded:

that when subjected to the higher forces generated by the earthquake on 22nd February 2011, Christchurch's unreinforced masonry building stock sustained much greater and more widespread damage than in the 4th September 2010 earthquake. Cases of severe structural damage to RCM (reinforced concrete masonry) buildings were found in the vicinity of the CBD. Structural damage to these buildings has been documented and is currently being studied to establish the lessons which can be learned from this earthquake and how to incorporate these lessons into future RCM design and construction.<sup>479</sup>

The extensive technical recommendations of the Royal Commission<sup>480</sup> include improving the geotechnical information available for building sites; far greater involvement of structural engineers in the planning process, and greater information to be available to the relevant authorities on seismicity of regions and districts. Significantly, the study did not document the performance of reinforced buildings against unreinforced ones in terms of numbers of lives lost.

Turning to examples the development of social capital, New Zealand Tourism has promoted positive upbeat messages, reflecting the resilience of the city and its people, following the earthquake to encourage tourists to continue to visit Christchurch:

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<sup>479</sup> Dizhur, Dmytro, Jason Ingham, Lisa Moon, Mike Griffith, Arturo Schultz, Ilaria Senaldi, Guido Magenes et al, "Performance of masonry buildings and churches in the 22 February 2011 Christchurch earthquake", *Bulletin of the New Zealand Society For Earthquake Engineering*, Vol. 44, No. 4, December 2011, pp. 279-295.

<sup>480</sup> Canterbury Earthquakes Royal Commission. <http://canterbury.royalcommission.govt.nz/>

The city has bounced back after a series of earthquakes, and all public services and spaces are running as normal.<sup>481</sup>

The buildings may have been damaged but the soul of the city and the welcoming spirit of the people remain very much intact. Don't miss visiting Christchurch.<sup>482</sup>

The University of Canterbury created the CEISMIC Programme (Canterbury Earthquake Images, Stories and Media Integrated Collection) to provide access to a broad range of earthquake-related research material, gathered by leading New Zealand cultural and educational organisations:

Our task now is to increase the content available through UC CEISMIC search, and ensure it is safeguarded for future generations. We've cast a net over our cultural heritage community to give the people of Christchurch and New Zealand a single place to create, remember and research their heritage, but we need your help to build it. You're also invited to contribute to our efforts.<sup>483</sup>

A Christchurch local resident, Adam Hutchison created the website [whenmyhomeshook.co.nz](http://whenmyhomeshook.co.nz)<sup>484</sup> for children to record and openly share their earthquake stories. These accounts may become part of the UC CEISMIC archive. The New Zealand Ministry of Civil Defence & Emergency Management in their media release on 22 February 2011 called on citizens to assist vulnerable people who may need help due to the effects of the earthquake, "help people who require special assistance - infants, elderly people, those without transportation, large families who may need additional help, people with disabilities, and the people who care for them".<sup>485</sup>

CERA, in a press release on 18 March, 2014, provided results of the Third Canterbury Earthquake Recovery Authority Wellbeing Survey, with 2,476 residents being selected randomly from the electoral roll in Christchurch city, and the surrounding districts of Selwyn and Waimakariri, with around 75% of Greater Christchurch residents being satisfied with the positivity of their life: It stated, "overall three quarters of Greater Christchurch residents rate the quality of their life positively, which remains consistent with surveys taken in September 2012 and April 2013."<sup>486</sup>

CERA chief executive Roger Sutton is quoted as saying that the results show that the earthquakes are now having less of an impact on many residents' lives than six months ago. "While most respondents do acknowledge there are areas of their lives which are still affected by the earthquakes, the focus has changed. We used to hear about the anxiety people felt about aftershocks, dealing with frightened children and

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<sup>481</sup> New Zealand Tourism. <http://www.newzealand.com/uk/christchurch/>

<sup>482</sup> New Zealand Tourism. <http://www.newzealand.com/uk/christchurch-canterbury/>

<sup>483</sup> University of Canterbury. <http://www.ceismic.org.nz/>

<sup>484</sup> <http://whenmyhomeshook.co.nz/>

<sup>485</sup> Ministry of Civil Defence & Emergency Management. [http://www.civildefence.govt.nz/memwebsite.nsf/wpg\\_URL/Media-Media-release-archive-Index?OpenDocument](http://www.civildefence.govt.nz/memwebsite.nsf/wpg_URL/Media-Media-release-archive-Index?OpenDocument)

<sup>486</sup> CERA. <http://cera.govt.nz/news/2014/secondary-stressors-now-a-larger-factor-for-earthquake-affected-residents-18-march-2014>

work safety concerns.” “Those stressors are being replaced with frustrations about traffic, and other work-related issues.”<sup>487</sup>

CERA’s webpages provide an extensive range of links to assist members of the public and communities. The community resilience webpage contains positive language specifically directed towards recovering from the earthquakes:

Community resilience requires participation from the whole community to improve response and recovery, and to help the community plan for the future. The impact and effect of the earthquakes have been different for each and every one of us. As a wider community we are all in this together. It’s important that we continue to champion the strong sense of community that helped us manage and move forward following the earthquakes.<sup>488</sup>

### **Economic response**

In the media release issued on 24 February 2011 the Ministry of Civil Defence and Emergency Management directed advice to local businesses who were keen to offer expertise, and to people wishing to volunteer, who were advised to wait, and not to send employees or resources or to go to Christchurch themselves. Instead, they were advised, “when local authorities have a clear idea of what is needed and are in a position to manage goods and volunteers they will advise publicly what is needed and where.”<sup>489</sup>

Responsibility for economic recovery coordination and skills/workforce planning fell to CERA, working in partnership with local, city and regional councils and other agencies. The Canterbury Economic Recovery Dashboard provided monthly updates on the earthquake recovery in Christchurch.<sup>490</sup> The latest published dashboard report, August 2013, supplied information represented in graphs, including the following areas, most of which showed an upward trajectory of growth and improvement: output, consumer spend, agriculture, manufacturing, services, tourism, investment, housing, insurance, business development, population, employment, and spending.<sup>491</sup>

CERA, as part of the Canterbury Earthquake Recovery project, is using a Better Business Case model to consider projects and programmes requiring Crown investment in whole or in part. The model is based on five key cases: strategic, economic, commercial, financial and management, and overall how the case meets the recovery strategy. Funding decisions are then made after an evaluation of the respective business cases.<sup>492</sup> The Canterbury Economic Indicators Quarterly Report, August 2013 gives a more in-depth analysis of the economic recovery and response, as evident in the following upbeat summary:

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<sup>487</sup> Ibid.

<sup>488</sup> CERA. <http://cera.govt.nz/community-resilience>

<sup>489</sup> Ministry of Civil Defence & Emergency Management. [http://www.civildefence.govt.nz/memwebsite.nsf/wpg\\_URL/Media-Media-release-archive-Index?OpenDocument](http://www.civildefence.govt.nz/memwebsite.nsf/wpg_URL/Media-Media-release-archive-Index?OpenDocument)

<sup>490</sup> CERA. <http://cera.govt.nz/economic-indicators>

<sup>491</sup> CERA. <http://cera.govt.nz/sites/cera.govt.nz/files/common/canterbury-economic-recovery-dashboard-august-2013.pdf>

<sup>492</sup> CERA. <http://cera.govt.nz/better-business-cases>

The Canterbury economy continues to grow and consumer confidence remains steady. International and domestic tourism is returning to pre-earthquake levels and more taxpayers are migrating into greater Christchurch than migrating out. Commercial investment remains significantly more optimistic for Canterbury than for the rest of New Zealand: greater Christchurch has been the most confident commercial property investment market every quarter since 2011, according to Colliers International results of June 2013. However, such high rates of growth present challenges as well as opportunities. Noticeably, house prices and rents are rising steadily. The higher demand in the labour market is putting pressure on employers who are having difficulties in finding skilled labour.<sup>493</sup>

The economic response appears to have been successfully managed and coordinated by CERA as the previous summary from the Canterbury Economic Indicators Report demonstrates. Undoubtedly, achieving this level of sustained progress will have been dependent upon very high levels of capital funding, inter-agency working and co-operation, however, however the position is unclear regarding the success of inter-agency co-operation. There have been tensions between the various agencies or personalities working within them during the renewal process, and in particular between CERA and Christchurch City Council (CCC), a fact acknowledged by CERA Chief Executive, Roger Sutton. In responding to criticism that the rebuild was taking too long, Sutton admitted that the rebuild was a bigger project than he initially thought and that relationships with the government and local council had at times been volatile:

When asked about the strained relationship between CERA and the Christchurch City Council, Mr Sutton said: "We'd like to think that we're here to make it work, we're here to help and we're trying to support this community''".<sup>494</sup>

Most likely, these tensions will have come to prominence over the uncomfortable fit between the democratically elected city council with their agreed governance procedures for consultation, decision making and accountability, and the more direct decision making processes employed by CERA. Tensions between CERA and CCC also surfaced over the city's housing shortages, with the two bodies committing to work together to address the problem, which has driven up rents and house prices, with the problem predicted to worsen up until 2017:

I would like to think this is a new start . . . that we can work together. There is so much at stake," council housing committee chairman Cr Glenn Livingstone said yesterday (27.11.13).<sup>495</sup>

### **Critical conclusions from an IRISS perspective**

- Surveillance technologies were deployed extensively to monitor ground movements and other seismological activity, however the earthquake on 22 February, 2011 was not predicted by the scientific community and occurred on a previously unknown fault line;

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<sup>493</sup> CERA, "Canterbury Economic Indicators", August 2013. <http://cera.govt.nz/sites/cera.govt.nz/files/common/canterbury-economic-indicators-quarterly-report-august-2013.pdf>

<sup>494</sup> TVNZ. <http://tvnz.co.nz/national-news/christchurch-rebuild-balancing-act-cera-5846679>

<sup>495</sup> Cairns, Lois, "Housing pinch to worsen until 2017", *The Press*, 27 November 2013. <http://www.stuff.co.nz/the-press/business/your-property/9446008/Housing-pinch-to-worsen-until-2017>

- The resilience of the built environment, particularly in some parts of the central business district, was found not to be have been sufficient enough to withstand the effects of the earthquake, and lessons learned from both an extensive survey and a Royal Commission Inquiry will used for future RCM (reinforced concrete masonry) design and construction; regional and district planning, supply of geotechnical and seismological information, and greater use of structural engineering information and expertise in planning application processes;
- The immediate institutional response in terms of media communications was informative, practical and appropriate, and a state of emergency was declared the day following the event by the New Zealand Government, continuing for around nine weeks;
- The enduring institutional response saw the passing of an Act of Parliament, within two months of the disaster, and the creation of a dedicated agency: the Canterbury Earthquake Recovery Agency (CERA), which is continuing to support both the physical rebuild of properties and infrastructure, and the social capital of the Canterbury region and Christchurch city;
- The resilience of the agencies involved in the rebuild of the physical, economic and social infrastructure is clearly evident and successful according to the Canterbury Economic Indicators Report (August 2013), however there have been criticisms that the rebuild is too slow, and there is evidence of tensions and volatility in particular between CERA and CCC, and
- The rebuilding of social capital has been extensive and has involved many agencies working on different aspects, including keeping channels open for communities and individuals including children to record their ‘stories’ such as oral history projects, and in particular the CEISMIC project established by the University of Canterbury whose objective is collect material relating to the earthquake and to give the people of Christchurch and New Zealand a single place to create, remember and research their heritage.<sup>496</sup>

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<sup>496</sup> The author is indebted to Elizabeth Eppel of the University of Wellington, NZ for her kind assistance.

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### **3.3 STRESSING EVENTS THAT CONTINUE OVER A PERIOD OF TIME**

This section covers the second type of adverse events – stressing events that continue over a period of time.

#### **3.3.1 Resilience after the 2008 Global Financial Crisis**

*Professor Kirstie Ball, Open University*

##### **Introduction**

Events surrounding the financial crisis of 2008 provide potentially significant insight into resilience-building in capitalist societies. They also reflect some problems with the concept of resilience and the protracted policy focus thereon. This short report will outline the findings of a literature review into issues of resilience surrounding the financial crisis. It will highlight the aspects of the financial system which need to be made more resilient in future. It also tackles the problem of path-dependency in society-level constructions of resilience as well as the elitism inherent in popular constructions of the concept. The report proceeds as follows. The first section outlines the sequence of events which prompted the financial crisis in 2008. It then examines the elements of the financial system which would need to be addressed in order for it to be made more resilient in future. Finally, it provides some critical reflections on the concept of resilience.

##### **The Global Financial Crisis 2008**

The Global Financial Crisis (GFC) of 2008 had its origins in the US and UK housing markets. Increases in house prices, excessive liquidity in financial markets coupled with the easy availability of credit led to a growth in mortgage lending, as sub-prime mortgages emerged in the USA and UK. Alongside the growth in sub-prime