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**STATISTICS DIRECTORATE  
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**Working Party on National Accounts**

**MEASURING UP**

**THE IMPACT OF THE CANTERBURY EARTHQUAKES ON STATISTICS NEW ZEALAND**

**To be held on 27 - 28 October 2011  
OECD Conference Centre  
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*This document has been prepared by Rachael Milicich (Statistics New Zealand) and will be presented under item 4 of the draft agenda*

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## MEASURING UP

### THE IMPACT OF THE CANTERBURY EARTHQUAKES ON STATISTICS NEW ZEALAND

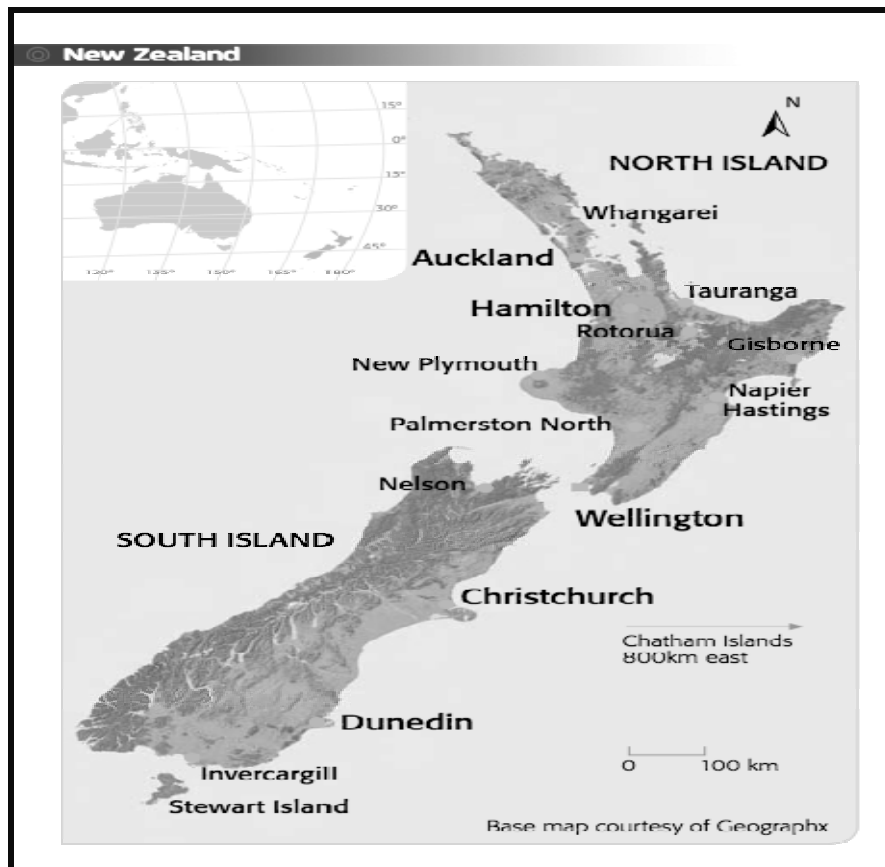
The purpose of this paper is to provide an overview of New Zealand's recent experience with the Canterbury earthquakes, which included a major impact on our own operations.

#### BACKGROUND

##### *Geography*

New Zealand is an island country in the south-west Pacific, comparable in size to the United Kingdom and the Philippines. New Zealand comprises the North and South Islands, and a host of smaller islands. The country sits on the 'Pacific Rim of Fire', which means that it is seismically active with a number of active fault lines and volcanoes.

Figure 1: Map of New Zealand from NZ in Profile



The capital city is Wellington and the largest city and main port is Auckland. Christchurch is the largest city in the South Island.

### *Population*

New Zealand has a diverse multicultural population of over 4 million people, making it one of the world's least-crowded countries. New Zealand's indigenous Māori make up around 15 per cent of the population.

**Table 1: New Zealand's Resident Population**

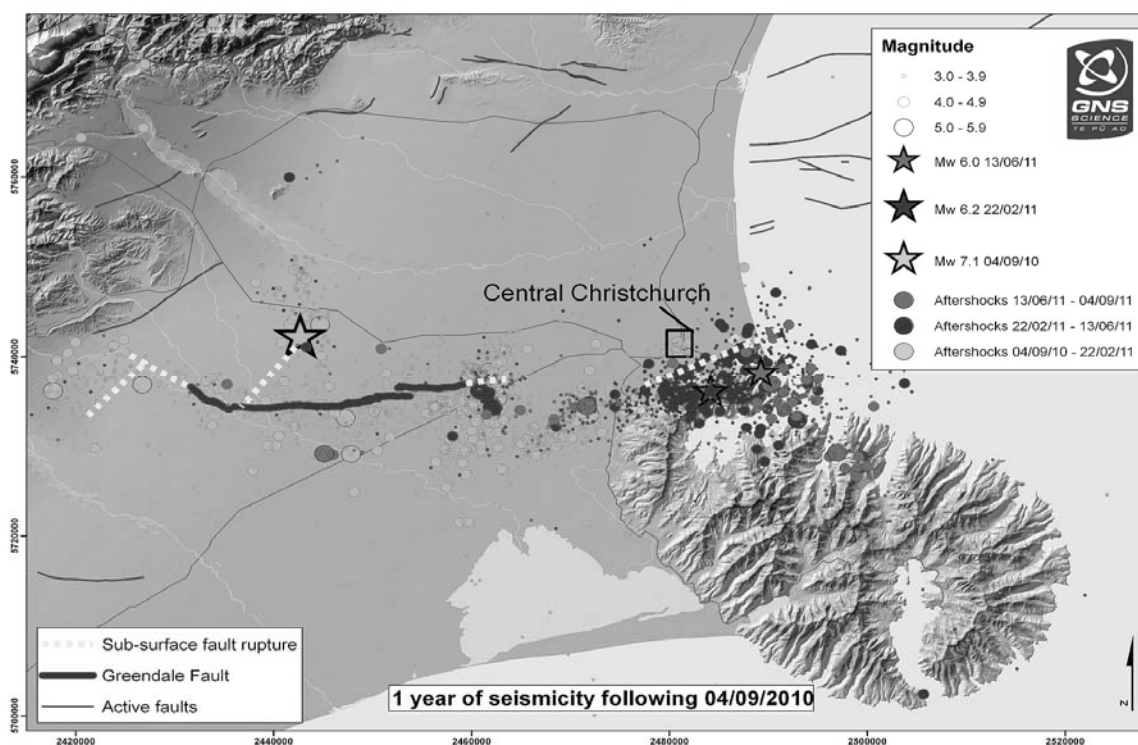
| Resident Population (2010)<br>Main Urban Area | As at 30 June<br>Number (thousands) |
|---|-------------------------------------|
| Auckland                                      | 1,354.9                             |
| Hamilton                                      | 203.4                               |
| Tauranga                                      | 120.0                               |
| Napier-Hastings                               | 124.4                               |
| Wellington                                    | 389.7                               |
| <b>Christchurch</b>                           | <b>390.3</b>                        |
| Dunedin                                       | 116.6                               |
| Remaining urban areas                         | 464.1                               |
| Subtotal All 16 Main Urban Areas              | 3,163.3                             |
| Remaining areas                               | 1,204.4                             |
| <b>Total resident population</b>              | <b>4,367.8</b>                      |

Taken from *New Zealand in Profile 2011*, Statistics New Zealand

### *The Canterbury Earthquakes*

Since the 4<sup>th</sup> September 2010, the Canterbury region has suffered around 2775 earthquakes over magnitude 3.0 (on the Richter scale) according GNS Science, including 3 major ones ranging in strength from 7.1 to 6.3.

Figure 2: Map of the Canterbury Earthquakes



Downloaded from [www.geonet.org.nz](http://www.geonet.org.nz)

The first earthquake, although the highest on the Richter scale, was not the most damaging. It was centred to the west of Christchurch city and occurred in the early hours of the morning. Although there was significant property damage in the region, no lives were lost. A state of emergency was declared and remained in place across the three worst affected districts until 16<sup>th</sup> September 2010. The recovery efforts from the September 2010 earthquake were well underway before Christmas.

The most damaging earthquake was the second one on 22<sup>nd</sup> February 2011, centred in Christchurch city at a shallow depth, causing significant damage including two tragic building collapses, killing 181 people in total. It occurred during lunch hour, which meant that many people were in the city and in office buildings near the epicentre of the earthquake.

The third significant earthquake occurred on June 13<sup>th</sup> 2011, compounding much of the property damage from the February earthquake, but with no further loss of life.

### *Statistics New Zealand*

Statistics New Zealand Tauranga Aotearoa is a government department and New Zealand's national statistical office. The organisation is New Zealand's major source of official statistics and leader of the Official Statistics System (OSS).

The organisation has been publishing statistics for nearly 120 years and has three offices, one in Auckland, Wellington, and Christchurch, with around 1,000 staff in total.

National Accounts is based in Wellington as part of the Macroeconomic and Environment Statistics group, while most of the annual and quarterly input data provided by the Industry and Labour Statistics group originates from Christchurch.

Statistics New Zealand had three buildings in Christchurch prior to September 2010, two for the Population Census scheduled for 8<sup>th</sup> March 2011 and the main Christchurch office, Dollan House. Across these buildings, there were about 250 staff or a quarter of our organisation.

## **OUR RESPONSE**

This section will focus more on our response after the February 2011 earthquake as it was far more serious for our organisation and New Zealand.

In the September 2010 earthquake, the third floor of our main building in Christchurch was damaged and took about three months to repair. Accordingly, there were some delays to releases and impacts to development projects as people were relocated to other floors within the building. By January, the organisation was feeling confident that most of the impact had been mitigated.

### ***External engagement***

Understanding the expectations of government and our wider user community was very important during the emergency response phase, to ensure limited resources were dedicated to the 'right' statistics.

Shortly after the February earthquake a decision was taken to cancel the Population Census which was due to take place on March 8<sup>th</sup> 2011. It was considered infeasible to conduct given the extent of the damage to our operations in Christchurch and the personal impact on people throughout New Zealand. The Population Census will now be held in 2013.

Economic statistics such as quarterly GDP were seen as critically important by key users as they provided a level of confidence both nationally and internationally as to how the government and the country were responding to the situation.

The Reserve Bank in particular needed information to make critical decisions about monetary policy during this period. New Zealand monetary policy is based on an inflation-targeting regime which requires a range of key economic statistics including those from the National Accounts to support the central bank's decision-making.

External engagement with key users was central to our planning and helped us confirm the most important statistics needed from a national and Canterbury perspective. An exercise had taken place internally to attempt to prioritise our statistics, when the H1N1 flu virus was active, but it needed to be validated as appropriate for this situation.

One of the key challenges during this period was providing confidence and certainty to our users, while we were still assessing the impact across the organisation and on the staff in Christchurch.

In terms of National Accounts statistics, key users expressed a preference for quality over timeliness. This feedback was consistently received through a number of channels and was not unanticipated. New Zealand, as a small open economy, experiences more variability in its economic statistics than other economies. In New Zealand, our users expect improvements in timeliness that still maintain the quality of statistics rather than trading these two attributes off.

Statistics New Zealand has developed a good reputation with our key users, which meant that we could draw on their support and preparedness to work with us through this difficult period. Users have been accepting of a number of changes to our release schedule and a few decisions which have had to be communicated without a great deal of notice. Through a range of corporate updates we have been open about our working environment and the loss of our office buildings.

Another role that Statistics New Zealand was able to lead and support was the coordination of statistical activity in relation to the Canterbury earthquakes happening across the government. Government departments were contacted and asked about their plans and what statistical information was available.

An earthquake information portal was added to the Statistics New Zealand website to bring together statistical data and reports, including papers covering the impact on a range of core statistics like GDP. The portal can be found at this link, [http://www.stats.govt.nz/tools\\_and\\_services/services/earthquake-info-portal.aspx](http://www.stats.govt.nz/tools_and_services/services/earthquake-info-portal.aspx).

Engagement was also undertaken with businesses based in the Canterbury region, which spawned a new word in our vocabulary “Christchurch-ness”. There were two key initiatives. The first was the contacting of Christchurch businesses and businesses based elsewhere which had a Christchurch presence to discuss their situation and ability to report to Statistics New Zealand. This information was extremely valuable in combination with information from our own staff based in Christchurch when we were analysing the March 2011 quarter. The second contact with Christchurch businesses was to determine the level of inventory losses, as this couldn’t be determined from our usual data sources. A number of business units within the organisation worked together to support this work.

At a technical level, we were in contact with our colleagues at the Australian Bureau of Statistics and after the Japanese earthquake with our colleagues in Japan. We also reviewed papers and documents from other national statistics offices we found on the internet to help inform us.

### ***Managing the Response***

In the hours after the February 22<sup>nd</sup> earthquake, a state of emergency was declared in Christchurch and major emergency response effort was mobilised by central and local government. This meant evacuation, search and rescue and securing the central city.

Statistics New Zealand staff were evacuated and the buildings closed until they could be assessed for damage. While all of our staff in Christchurch were accounted for, many were deeply affected with personal and property loss. All our buildings were closed until they could be assessed for damage.

In the first few weeks, a number of management teams were put in place covering different aspects of the organisational response. The Manager National Accounts and the Project Manager for Quarterly GDP were part of the Outputs team, whose role was to assess the impact on the statistical releases programme and create a plan to ensure ongoing delivery.

The Outputs team was fully supported by our executive management team and given plenty of freedom to think creatively about how to ensure the continued delivery of our statistical releases. The focus was to create a number of scenarios on how best to use our limited resources, to deliver the statistics deemed most important in the short-term.

Decisions relating to the plan and scenarios were devolved to the team with regular progress reports to the Board. The same approach was also used with other teams to ensure that decisions were timely and would take in account the unique circumstances in Christchurch.

The membership of the core team was limited to those responsible for a prioritised list of statistics supplemented by a number of important support areas such as Statistical Methods, Integrated Data Collection, Information Technology, Product Development and Publishing, and Strategic Communications.

In the first few weeks, this team met daily as new information was made available. New information ranged from updates from within the organisation, to a wider government update about how government departments were responding, to information from staff and management on the ground in Christchurch.

From a National Accounts perspective, we hadn't received all of the necessary data for quarterly GDP which was due to be published on 24<sup>th</sup> March 2011. Manufacturing and Wholesale Trade were still being processed by the Business Indicator's team in Christchurch at the time of the February earthquake.

Until the systems used for processing these missing industries could be re-established, National Accounts created indicator series from the survey questionnaires which were available electronically from the Imaging Centre in our Auckland office. The indicator method was peer reviewed by Statistical Methods and deemed fit for purpose but would be replaced once the surveys were able to be processed and published.

Following the engineers reports, only one Statistics New Zealand building was able to be used consistently. This was a small regional office, originally meant for the Population Census, however its maximum capacity was 38 staff.

This led to the development of a roster system to ensure that teams requiring access to systems were able to. The remaining staff were on paid leave until working arrangements could be put in place. This practice was consistent across government departments.

One of the key developments during the first few weeks was the development of a remote access solution by the Information Technology team. Prior to the earthquake, Statistics New Zealand had a remote access option via the use of a laptop, but it was limited to parts of our information technology environment. This was insufficient to support our business continuity and so needed to be further developed in order to add significantly to our planning.

Some equipment that had been intended for the Population Census was also able to be utilised by the organisation for staff to work from home. The addition of this option enabled staff to work from home either partially or fully, depending on their role and team. It has proved essential to the continued supply of input data for National Accounts from Christchurch-based teams to have staff able to work independently.

The impact of the earthquakes, has led to a number of changes in our information technology environment including a greater use of virtual computing environments and remote access. While our response efforts in this area were successful, we want to ensure that we learn from our experience and are better prepared should something similar happen to us again.

Over the past year, Statistics New Zealand has used five different temporary locations and are now starting to consolidate into three main locations. Our main building in Christchurch, Dollan House is undergoing extensive repairs and will be available once they are complete.

Once the plan was in the execution phase, meetings moved to a weekly routine and a formal earthquake recovery management structure was put in place as part of the strategy group, Organisation Directions within Statistics New Zealand. This team is currently still in place and likely to continue to for some time to come.

***The Schedule of National Accounts statistical releases***

In the 12 month period to June 30 2011, Statistics New Zealand delivered 240 statistical releases with 32 (13 percent) delayed as a result of the quakes.

The table below summarises National Accounts releases since the February 2011 earthquake. The two quarterly GDP releases prior to February 2011 were not significantly affected by the September 2010 earthquake.

| <b>Statistic</b>         | <b>Reference Period</b>                       | <b>Schedule</b>  | <b>Methodology</b>  |
|--------------------------|---|--|---|
| Quarterly GDP            | December 2010 quarter<br>Released 24 Mar 2011 | No impact on the schedule.                             | An individual indicator was developed for sales and stocks for Manufacturing and Wholesale Trade  |
|                          | March 2011 quarter<br>Released 14 Jul 2011    | Was delayed for two weeks, but further delayed a week. | Complete review of methodologies<br>Collection of additional data about inventory write-off<br>Collection of information about operations for Canterbury businesses<br>Change of treatment for international reinsurance flows in the Balance of Payments |
|                          | June 2011 quarter<br>Released on 22 Sep 2011  | No impact on the schedule.                             | No additional data was needed but reviews were conducted in relation to potential Canterbury impacts.   |
| Annual National Accounts | March 2011 year<br>To be released Nov 2011    | On track   | Will include provisional estimates for the Canterbury earthquakes   |

The March 2011 quarter GDP release proved to be the most challenging to compile by far. Following the publication of the December 2011 quarter, a decision was taken to delay the March 2011 quarter GDP release by two weeks.

This was our best estimate at the time of the additional work that would need to be completed to review our methodologies and existing data sources, incorporate new data sources following additional collection activity and to bring it all together for the release. It was also agreed that a paper outlining the impacts was to be written and released alongside the statistical release.

Despite our best efforts, we were unable to complete all this work in time and a late decision was made to postpone the release by another week. Although this was a difficult decision, quality was placed ahead of timeliness as users had suggested.

Once the release was finally published, our users expressed their thanks for our efforts and were pleased to see in our latest quarterly GDP release that we did not significantly revise the results.

While all the work was happening to ensure the quarterly GDP statistics were delivered, we were also trying to maintain our schedule for our development projects. We have a significant development programme which is updating our industry classification and delivering a new upgraded system for producing quarterly GDP. This remains a challenge for us.



### ***Key Conceptual and Measurement Issues***

A number of conceptual issues obviously arise with large events such as a natural disaster, so this section is limited to the key ones for New Zealand. The treatment of the international reinsurance flows within the Balance of Payments and in the National Accounts was a good example of a conceptual issue that we had to grapple with.

With three large seismic events in the Canterbury region, there has been a compounding effect in terms of the damage, which led to us revisiting a decision that had been made following the September 2010 earthquake. The following paper was produced ahead of the Balance of Payments release in June 2011 outlining the change.

[http://www.stats.govt.nz/browse\\_for\\_stats/economic\\_indicators/balance\\_of\\_payments/revised-treatment-earthquakes-insurance-claims.aspx](http://www.stats.govt.nz/browse_for_stats/economic_indicators/balance_of_payments/revised-treatment-earthquakes-insurance-claims.aspx)

The key conceptual difficulty was determining at which point the flows should be treated as capital rather than current transfers, because there are currently no criteria to determine when a natural disaster moves from a 'minor' to a 'major' disaster, to use the terminology from one paper.

Our decision in March 2011 was to reclassify from current transfers to capital transfers, the reinsurance flows. New Zealand has had large earthquakes previously, however, this treatment was only applied to the Canterbury earthquakes and we would have to assess future events as to whether they also would be treated the same way. The scale of the damage and national impact of the Canterbury earthquakes arguably sets it apart from previous natural disasters in New Zealand.

The key measurement issues for quarterly GDP were tackled with a systematic review of all our inputs and methodologies. More detail about the measurement impact on GDP is covered in this paper, [http://www.stats.govt.nz/browse\\_for\\_stats/economic\\_indicators/GDP/impact-canterbury-earthquakes-nz-gdp.aspx](http://www.stats.govt.nz/browse_for_stats/economic_indicators/GDP/impact-canterbury-earthquakes-nz-gdp.aspx)

The impact on the annual national accounts is still being worked through for our November 2011 release. There is good information about the impacts on property including demolitions and insurance claims and premiums for different types of policies but identifying the impact on infrastructure and plant, machinery and equipment requires more investigation.

### ***Collection changes, suspension and cancellation***

In addition to the cancellation of the Population Census, Statistics New Zealand had to suspend collections (including surveys, phone, and face-to-face interviews) for the whole of the South Island for the first week following the February earthquake.

For the following week, no collection occurred in the Canterbury region. For the remaining four weeks of the March 2011 quarter, no collection took place in Christchurch city, or the surrounding districts. This impacted the data collected for the June 2011 quarter's releases, including Household Labour Force Survey and Consumers Price Index.

Statistical Methods provided additional support post the earthquakes to assess potential impacts on individual surveys and administrative collections such as tax records and appropriate treatments where required to address issues.

Changes were made to the questionnaires for the Annual Enterprise Survey before they were dispatched to collect information over the earthquake period. As a key data source, the updated Annual

Enterprise Survey should provide more detailed estimates of the impact on the capital stock for New Zealand and replace the provisional estimates in the annual National Accounts.

### ***Government Responses***

Although the government responded in many ways following the earthquakes, there were five key responses in the form of two employment-related support packages, an intervention in the New Zealand insurance market, land purchases and one new government agency that will be covered here.

Government announced two support packages for employees after the September 2010 and February 2011 earthquakes. The first package, the Earthquake Support Subsidy, was to enable small employers to keep their staff on until their businesses were operational.

The second support package, Earthquake Job Loss Cover, was an emergency benefit to employees who had lost their jobs as a result of the earthquake. This was available for up to eight weeks after the February earthquake. In the national accounts, this package was treated the same as an unemployment benefit.

The nature of the Canterbury earthquakes meant that insurance companies in New Zealand faced a two '1 in 1000 year' events within six months. One large insurance company in New Zealand was particularly exposed with a 35 percent of the residential insurance market in Christchurch. In April 2011, the government agreed a deal with the insurance company. The following features were outlined in a media release:

- A support arrangement of up to NZ\$500 million which provides the company with a platform from which to explore further recapitalisation options;
- A NZ\$15 million up front establishment fee for the support package;
- The company has issued convertible preference shares to the government;
- Payment of up to NZ\$500 million will happen only if the company's own resources are depleted below the level that is prudent for an insurance business, or if the government decides it is in the public interest to make a payment;
- In exchange, the government could take ownership of the company and have control of the board;
- If the arrangement is called on by the company, it can later exit the support arrangement by repaying the government, along with any dividends owing.

In April 2011, the Canterbury Earthquake Recovery Act 2011 was passed into legislation, and provided for a new government agency called the Canterbury Earthquake Recovery Authority or CERA.

The purpose of this new agency from their Statement of Intent is "to ensure that services and economic, social, community and cultural wellbeing are restored to greater Christchurch." The agency has a number of responsibilities including, cordon management, demolition and decision-making around the restoration of public services, coordination activities and developing a long-term recovery strategy.

This new agency is part of central government, with data provided through the Crown Financial Information System run by the New Zealand Treasury and through direct contact made with the agency themselves.

In June 2011, the government announced an offer to homeowners with severely impaired land. For people who owned property with insurance in these areas, known as “the residential red zone” on 3<sup>rd</sup> September 2010 (the day before the first Canterbury earthquake) there are two options:

- the government makes an offer of purchase for the entire property at current rating value (less any built property insurance payments already made), and assumes all the insurance claims other than contents; or
- the government makes an offer of purchase for the land only, and homeowners can continue to deal with their own insurer about their homes.

The package impacts around 5000 homes and is currently estimated to cost the government between NZ\$485 million and NZ\$635 million for these properties.

### *Māori Responses*

A unique aspect of the response efforts in Christchurch has been the response by Māori. Ngāi Tahu (the local Māori tribe) are the largest tribe in the South Island.

They are important planning and funding partners for the local Christchurch Council and also have a statutory role in land management across the Canterbury region.

Ngāi Tahu had been actively working with local authorities and recovery programmes since the September 2010 earthquake. When the February 2011 earthquake occurred, Ngāi Tahu immediately called for the other tribes nationally to come and assist. This resulted in many tribes coming to Christchurch in the first week after the February earthquake and offering their resources to assist recovery with the support of the Minister of Māori Affairs.

For instance, Māori wardens arrived from across the country and led a door to door knocking campaign right through eastern parts of Christchurch [ie. worst affected area] to help deliver food parcels and identify people in need of medical assistance and other social services.

Ngāi Tahu immediately set up new offices (their offices were lost in the February earthquake) and provided temporary office space to government agencies that had lost their own office accommodation in the earthquake, such as Te Puni Kokiri, the Ministry of Māori Affairs and other agencies that needed to come to Christchurch to deal with the situation.

Marae (traditional meeting areas for Māori, including land and buildings) outside of Christchurch became immediate hosts for people needing to evacuate. In the case of the Pipitea marae in Wellington, a large number of foreign students that were airlifted out by the New Zealand Air Force were hosted within the first 36 hours of the February earthquake.

The urban marae in the worst affected part of Christchurch in the eastern suburbs were able to set up as an emergency defence centres, and later one marae was approved as a Court facility when temporary Courts needed to be set up.

Traditional Māori custom continued to be reflected throughout the civil emergency period, such as Māori services being offered to all and everyone; and Ngāi Tahu giving a free ‘feed’ of oysters to all the Army personnel who had worked through the earthquake civil emergency as a sign of thanks!

Now that Christchurch is in recovery mode, Ngāi Tahu are working in partnership with local authorities to achieve recovery. Examples of the many contributions include fast-tracked ‘to be developed residential land’ owned by Ngāi Tahu so it could be released for sale for people needing to re-locate their

property; and the sponsoring of a Māori trades apprenticeship scheme to attract and develop the necessary workforce to rebuild Christchurch.

## **KEY LEARNING**

From Statistics New Zealand's experience, there were several factors that have enabled us to keep National Accounts reporting on the economy. These can be grouped under a few headings.

The first group of factors are described as pre-conditions, as without these in place, recovering our operations effectively would have been extremely difficult.

### ***Pre-conditions***

- Having a good relationship with our user community prior to the earthquakes. This meant there was already a degree of trust established and support for the challenges that we faced as an organisation to try to re-establish our operations.
- Having a clear set of priorities informed by user needs and specialised teams focussed on the response and recovery phases. This simplified the approach and the scale of the response needed in the early weeks following the earthquake.
- Having imaged questionnaires available from our Auckland office-based imaging centre. Statistics New Zealand had moved to having a centralised imaging centre in Auckland to process survey questionnaires and migration cards about ten years ago. This meant that we had the option of creating an indicator from these survey questionnaires, until work could be recovered or if required completely reprocessed.
- The timely decision regarding the Population Census meant that these resources where available, were able to be deployed towards maintaining the prioritised statistical release schedule from the beginning.

The second group of factors reflect the degree of flexibility we were able to generate in response.

### ***Adaptability***

- The use of a remote access option for Christchurch staff. This meant that staff in Christchurch could be utilised and moving to temporary locations was made easier. There were still challenges with teams not co-located but this was mitigated to some degree with meetings and travel to Wellington and Auckland where necessary.
- Having committed staff across the organisation, but particularly in Christchurch. Christchurch staff have had to endure enormous challenges over the past year from both a professional and personal point of view. They have still remained dedicated to the organisation and our statistics.
- The willingness of the Canterbury region, whether it was households, business or local government to work with Statistics New Zealand to ensure that we could collect the information needed for official statistics.

## **CONCLUSION**

The Canterbury earthquakes directly impacted Statistics New Zealand and are the largest natural disaster in New Zealand for several decades.

This has been a huge test of our resilience and adaptability as an organisation but one that we have navigated so far. There have been a range of responses and impacts and we hope this paper is a useful synopsis of our experiences.

#### **QUESTIONS FOR THE WORKING PARTY ON NATIONAL ACCOUNTS**

- Is it possible to determine guidelines on when international re-insurance flows are treated as capital transfers rather than current transfers? The 2008 SNA and BPM6 allow the capital transfers treatment, but there is not as much detail about when the treatment should be applied.
- How are the National Accounts in other countries prepared for the possibility of being impacted by natural disasters? Is there any experience that would be good to share?
- Do your organisations have a clear set of priorities for official statistics in a national emergency situation? Is there a point at which the compilation and publication of the (full) National Accounts would not be feasible?

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