McSaveney, 2016

Story: Historic earthquakes

Page 13. The 2011 Christchurch earthquake and other recent earthquakes

On Tuesday 22 February 2011 at 12.51 p.m. Christchurch was badly damaged by a magnitude 6.3 earthquake, which killed 185 people and injured several thousand. The earthquake epicentre was near Lyttelton, just 10 kilometres south-east of Christchurch's central business district. The earthquake occurred more than five months after the 4 September 2010 earthquake, but is considered to be an aftershock of the earlier quake.

Casualties and damage

One hundred and eighty five people died as a result of the 22 February earthquake which occurred during lunch time, when many people were on the city streets. One hundred and fifteen died in the CTV building, 18 in the PGC building, 36 in the central city (including eight on buses), and 12 in the suburbs (including from falling rocks in the Redcliffs, Sumner and Port Hills). The Chief Coroner determined that another four deaths were directly associated with the earthquake. (A complete list of the deceased can be found on the New Zealand Police website.)

A violent earthquake

Although not as powerful as the magnitude 7.1 earthquake on 4 September 2010, this earthquake occurred on a faultline that was shallow and close to the city, so the shaking was particularly destructive. In the February 2011 quake, the fault movement and structure of the bedrock produced exceptionally strong ground motion – up to 1.8 times the acceleration due to gravity in the eastern suburbs. In the city centre ground accelerations were three to four times greater than the ground motion produced by the September 2010 earthquake.

The earthquake brought down many buildings previously damaged in the September 2010 earthquake, especially older brick and mortar buildings. Many heritage buildings were heavily damaged, including the Provincial Council Chambers, Lyttelton's Timeball Station, and both the Anglican Christchurch Cathedral and the Catholic Cathedral of the Blessed Sacrament. Among the modern buildings damaged, and eventually demolished, was Christchurch's tallest building, the Hotel Grand Chancellor. Over a quarter of the buildings in the central business district were demolished.

Liquefaction

Liquefaction was much more extensive than in the September 2010 earthquake. Eastern sections of the city were built on a former swamp. Shaking turned water-saturated layers of sand and silt beneath the surface into sludge that squirted upwards through cracks. Properties and streets were buried in thick layers of silt, and water and sewage from broken pipes flooded streets. House foundations cracked and buckled, wrecking many homes. Despite the damage to homes, there were few serious injuries in residential houses in liquefaction areas. However, several thousand homes will have to be demolished, and some sections of suburbs will probably never be re-occupied.

Aftermath and exodus

The government immediately activated its National Crisis Management Centre, and declared a national state of emergency the day after the quake. Christchurch's central business district remained cordoned off for more than two years after the earthquake. Electricity was restored to 75% of the city within three days, but water supplies and sewerage systems took several years to restore in some areas affected by liquefaction.

In the weeks following the earthquake about 70,000 people were believed to have left the city due to uninhabitable homes, lack of basic services and continuing aftershocks. Timaru's population swelled by 20% and thousands of pupils registered at schools in other cities and towns. However, many were expected to return to Christchurch as conditions improved.

Fault beneath the Port Hills

The earthquake was caused by the rupture of a 15-kilometre-long fault along the southern edge of the city, from Cashmere to the Avon-Heathcote estuary. The fault slopes southward beneath the Port Hills and didn't break the surface, so scientists have used instrumental measurements to determine its location and movement.

Read more about the 2011 Christchurch earthquake on NZHistory.

2013 Cook Strait and Lake Grassmere earthquakes

At 5.09 p.m. on Sunday 21 July 2013 a magnitude 6.5 earthquake rocked central New Zealand, causing minor damage. The earthquake was centred in Cook Strait, about 20 kilometres east of Seddon in Marlborough. In Wellington city goods fell from supermarket shelves and plate glass and masonry fell from downtown buildings. Four people were hospitalised with minor injuries but there were no fatalities. The following day much of the central city was closed for business as buildings were assessed for structural damage.

The period of seismic activity continued with a 6.6 magnitude quake at 2.31 p.m. on Friday 16 August. Centred 10 kilometres south-east of Seddon, close to Lake Grassmere, the quake caused significant damage to buildings in Seddon and nearby towns. It was felt strongly in Wellington and through much of central New Zealand.

2016 Kaikōura earthquake

At 12.02 a.m. on Monday 14 November 2016 a magnitude 7.8 earthquake struck New Zealand, causing significant damage to buildings and infrastructure in southern Marlborough and northern Canterbury. Landslides cut off road and rail links to Kaikōura, stranding large numbers of visitors in the popular tourist town. The earthquake was centred east of Hanmer Springs at a depth of 15 kilometres. Scientists described it as having a 'complex fault structure' with the quake 'jumping from one fault rupture to another'. It was felt strongly in Canterbury, Marlborough, Wellington and the central North Island. Two people lost their lives: one at a property in Mt Lyford as a result of a heart attack and another when a homestead collapsed in Kaikōura.

For emergency information please go to http://www.civildefence.govt.nz or your local council website.