

The 2011 Christchurch earthquake

On **Tuesday 22 February 2011 at 12:51 p.m.** a **magnitude 6.3 earthquake** occurred at a depth of **5 kilometres**. Its epicentre was near Lyttelton, 10 kilometres south-east of the Christchurch central business district.

Major damage occurred in the city and there was considerable loss of life. Thousands of people were made homeless and many aftershocks, some of them severe, occurred.

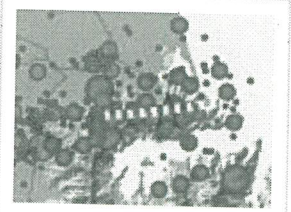
Many buildings, some of them historic, collapsed. Some had been weakened by the earthquake of September 2010.

National state of emergency was declared on Wednesday 23 February.

Te Ara will provide a full description of the event in due course. In the meantime, please see Te Ara's blog.

Useful links for further information

- GeoNet, data and news of New Zealand earthquakes.
- Google Person Finder: Christchurch Earthquake, February 2011, assistance in locating people affected by the earthquake.



Aftershocks map



Earthquake damage



Flickr exhibition:
earthquake damage
in Christchurch,
February 2011

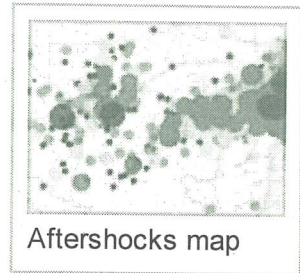




Historic earthquakes

The 2011 Christchurch earthquake

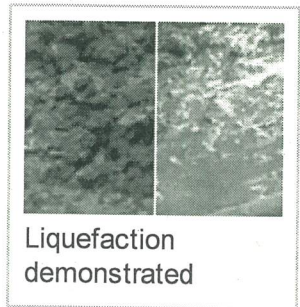
On Tuesday 22 February 2011 at 12.51 p.m. Christchurch was badly damaged by a magnitude 6.3 earthquake. As many as 182 people were killed and several thousand injured. The earthquake epicentre was near Lyttelton, just 10 kilometres south-east of Christchurch's central business district. The earthquake occurred more than five months after the **4 September 2010** earthquake, but is considered to be an aftershock of the earlier quake.



Aftershocks map

Casualties and damage

The earthquake occurred during lunch time, when many people were on the city streets. More than 110 fatalities were from the collapse of two multi-storey office buildings – the Canterbury Television and Pyne Gould Corporation buildings. Falling bricks and masonry on Manchester Street and Cashel Mall killed 11 people, and six died in two city buses crushed by crumbling walls. Rock cliffs behind houses collapsed in the Sumner and Redcliffs area, and boulders tumbled from the Port Hills summits, with five people killed by falling rocks.



Liquefaction demonstrated

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.



Earthquake damage

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 was Christchurch's tallest building, the Hotel Grand Chancellor. Nearly a third of the buildings in the central business district are expected to be demolished.



Flickr exhibition: earthquake damage in Christchurch, February 2011

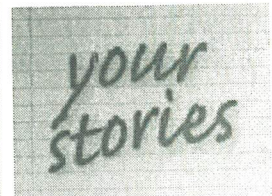
Liquefaction

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



Christchurch city after the quake

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.



Shaking in the
Press Building

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 a month after the earthquake. Electricity was restored to 75% of the city within three days, but water supplies and sewerage systems took a number of weeks to restore in 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.

Acknowledgements to GeoNet and GNS Science

How to cite this page: Eileen **McSaveney**. 'Historic earthquakes - The 2011 Christchurch earthquake', Te Ara - the Encyclopedia of New Zealand, updated **28-Mar-11**
URL: <http://www.TeAra.govt.nz/en/historic-earthquakes/13>