1855 Wairarapa Earthquake: Impacts and implications

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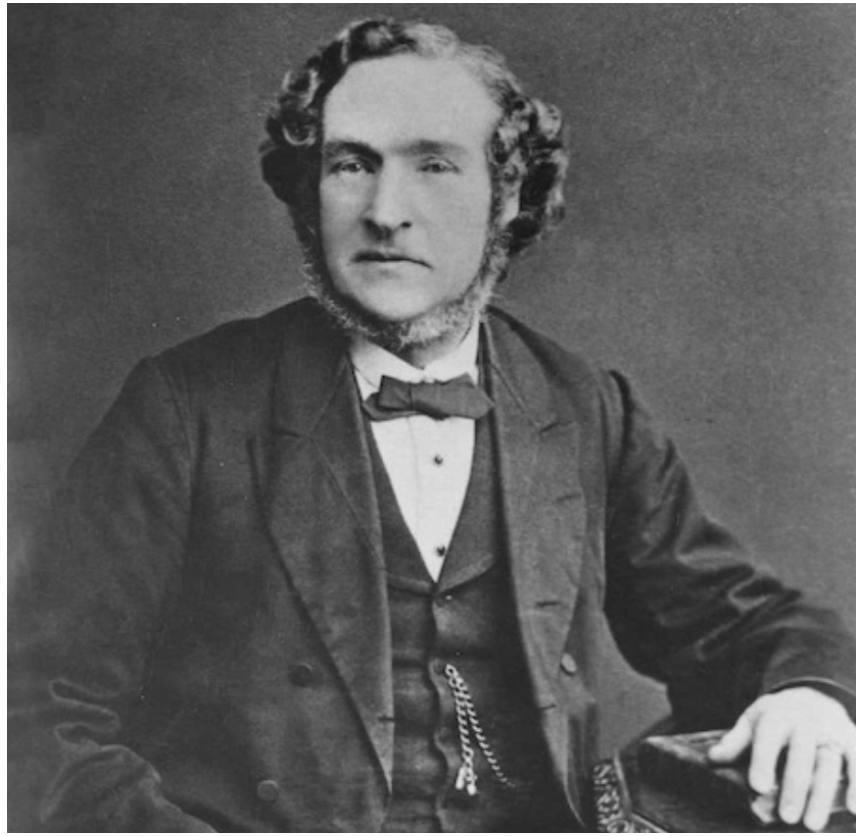
Context of 1855

- Settlers had little experience of earthquakes - many prior to 1855 caused little damage
- Buildings more likely to be made of timber, though cob, brick & timber sheathed houses were introduced later
- The latter were damaged in an 1848 Marlborough earthquake, and timber became preferred again.
- More brick buildings in Wellington for fire prevention and “their look”, and chimneys
- Early engineering bracing/strengthening advice provided (Charles Carter), but not widely taken up.



(Grapes and Downes, 1997)

https://teara.govt.nz/en/interactive/4392/extent-of-shaking-wairarapa-earthquake-23-january-1855

Context of 1855 earthquake

- Shortly after 9 p.m. a violent earthquake began
- In Wellington the main shock lasted for 50 seconds.
- People fled outdoors, where they remained for the night in tents and makeshift beds
- Aftershocks rocked the area – one person counted 250 in the first 11 hours.
- Aftershocks continued for months.

(McSaveney, 2007 -Te Ara Encyclopedia of NZ)

Human impacts

5-10 fatalities from fissures opening, building/whare collapse, falling chimneys and a dam-break flood on the Ruamahanga River.

Injuries reported included broken bones

Death and injuries were limited due to construction techniques, and time of day.

(Grapes and Downes, 1997; Times-Age)

— "the hour, too, was favourable to the escape of adults, who seized the children from beneath tottering chimneys, themselves not generally retired to bed" (extracts from Drury's Remarks book in *Spectator* Feb 7 1855).

Building damage

- Many reports – extending into lower North and Upper South Islands
- Because many buildings had been rebuilt in wood after 1848, they survived well.
- Two 2-storey wooden buildings, collapsed, but single-storey wooden houses survived.
- Many wooden buildings were damaged by falling brick chimneys, or shifted on foundations
- Only about 20% chimneys left intact
- Brick buildings were damaged or destroyed (e.g. Wellington jail & bank collapsed).

(McSaveney, 2007 -Te Ara Encyclopedia of NZ)

Christchurch 2011, Daily Mail

NZTA, 2023

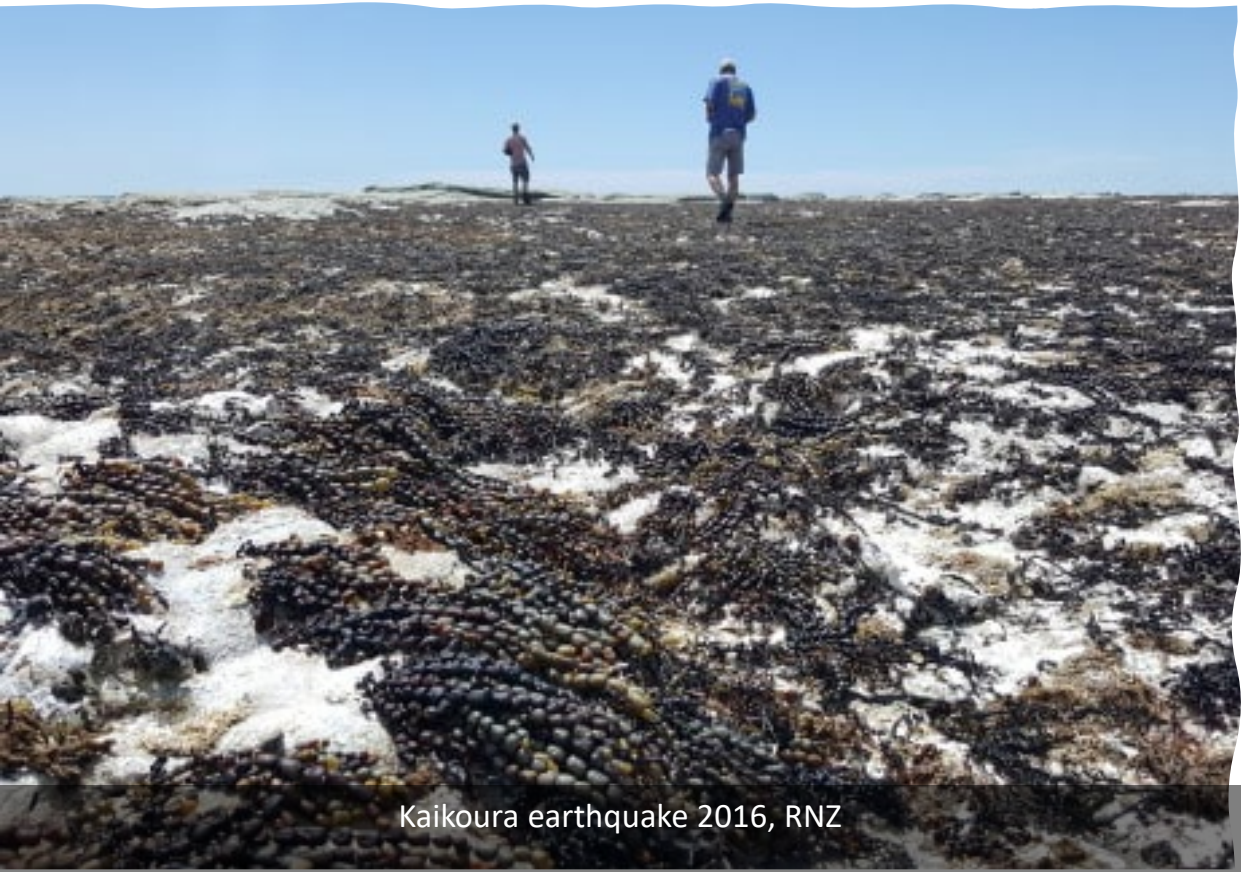
Transport routes damaged

- Extensive slips and fissures occurred in the Remutakas, Wairarapa, Hutt Valley, Kaikoura Ranges and beyond – blocking roads.
- Damage to bridges
- Uplift caused rivers like Te Awakairangi and Waiwhetu Stream to shallow, preventing boat travel.

Tsunami and seiche damage

- Houses and shops on Lambton Quay near the shoreline were flooded by tsunami waves (0.9 m)
- Uplift caused many jetties in Wellington Harbour to become unusable
- Benefits of uplift included more land for building and road links.

(Grapes and Downes 1997;
McSaveney, 2007 -Te Ara Encyclopedia of NZ)



Kaikoura earthquake 2016, RNZ

Ecological impacts

- Uplift stranded flora and fauna (e.g. shellfish, fish) on the rocky coast and tidal estuaries - some authors suggest the lack of species in Wellington Harbour is an effect of this event.
- Tsunami waves stranded near-shore fish
- Ironpans of lakes in sand dunes (e.g. Horowhenua, Manawatu) cracked and the lakes drained, stranding eels.
- Landslides stripped vegetation (e.g. nearly a third observed on the Remutakas)
- Lakeside and swamp vegetation was disturbed by seismic seiching.

(Grapes and Downes, 1997)

Ongoing aftershocks

- Aftershocks continued for months, with at least five magnitude 6.5+
- Widely felt from Christchurch to Gisborne.
- Give aftershocks, many preferred to sleep in tents or outside rather than return to houses.
- Aftershocks caused rockfalls, vegetation damage, wave activity, building damage (falling masonry, building collapse, damage to household goods), difficulty in rebuilding (e.g. roads, houses), and disruption (evacuation of houses during shaking, lack of sleep).
- People reported ongoing psychosocial impacts.

(Grapes and Downes, 1997)

"there was great destruction of household treasures, but the continuance of the shocks was so nerve wrecking in effect that many people believing that the end of all things was near, were quite indifferent to the ruin of their goods". Elizabeth Hollard (1930)

Response & recovery

- Sense of resilience required (settlers)
- Community helped each other, little crime
- Some were afraid and left, often returning to England. Others with experience of the 1848 earthquake were less alarmed, and stayed.
- Soldiers assisted in clearing damage and pulling down buildings.
- Business was resumed within a week, though aftershocks hampered some openings.
- Reconstruction began immediately, though some repairs were not completed for many months, and some were not undertaken because of the perceived recurring danger.

(Grapes and Downes, 1997)

Bridge St, Masterton in about five years after the 1855 earthquake

PHOTO/WAIRARAPA ARCHIVE

Aftermath

- After the 1848 and 1855 earthquakes, most new buildings in Wellington were constructed of wood (e.g. old Government Buildings in 1876).
- However, it took only 25–30 years for awareness to fade. Masonry construction returned, encouraged by regulations for fire resistance.
- By the beginning of the 20th century the earthquake hazard was largely discounted - between 1913 and 1926 the New Zealand Official Yearbook stated that *'earthquakes in New Zealand are rather a matter of scientific interest than a subject for alarm'.*

(McSaveney, 2007 -Te Ara Encyclopedia of NZ)

Old government buildings, Wellington - Wikipedia

What does this mean 150 years later?

Know your risk

Get ready!

Practice drills