

Oral Submission to the Proposed Housing and Business Choice Plan Change 14

Presented by: Greg Partridge, Richmond, Christchurch

Thank you for the chance to be able to speak to you today, and thank you for the work that you are doing.

The Christchurch City Council are being prompted by Central Government to enable more development within the city's existing urban footprint.

Any plan change must be well considered. It must ensure safe and sustainable development that prioritises the wellbeing of people and communities, and at the same time maintains and improves the quality of the existing natural environment, now and into the future. It must be intergenerational.

It is therefore essential that the outcomes of Plan Change 14 adequately consider

- The mental health and wellbeing of the population
- Protecting and increasing the existing tree canopy coverage of our neighbourhoods
- The natural hazards affecting our city and its future, such as:
 - Seismic activity
 - Shifting weather patterns
 - Climate change
 - Other Environmental factors

A failure to do so, and to blindly follow a Central Government directive without critically evaluating and challenging it, exposes not only the Government, but also the City Council and Christchurch residents to suffering the repeated outcomes and consequences of past mistakes, rather than learning from history.

The Council have a duty of care to act with good stewardship, to be the guardians of our city, the Kaitiaki of this place – now and into the future - for the implications of decisions made today will impact the generations who call this place home in the future, well beyond those who govern today.

Understanding the deltaic and seismic history of Christchurch, along with adapting to climate and weather pattern changes, and protecting the natural environment, is key to the future liveability of Christchurch.

The Water City

Christchurch is a water city. We are located on sedimentary land that was naturally a delta – a wetland that formed as rivers and streams drained out to the ocean. Many of the waterways however been paved over to make way for urban development.

Urban development has resulted in greater volumes of pollutant rich stormwater being discharged into our waterways.

Trees that were planted and green space that were able to flourish after the delta was drained by the early settlers, are vanishing as the rate of new development accelerates.



Housing intensification, which has been constructed by profit driven developers, is resulting in thousands of trees being clear-felled every year, and vast areas of green space being buried under concrete and asphalt, both of which prevent pollutants from being filtered by the land through nature-based solutions. The clear felling of the urban tree canopy, also increases sedimentary runoff which is detrimental to the health of waterways, and accelerates the development of urban heat islands which are detrimental to human health.

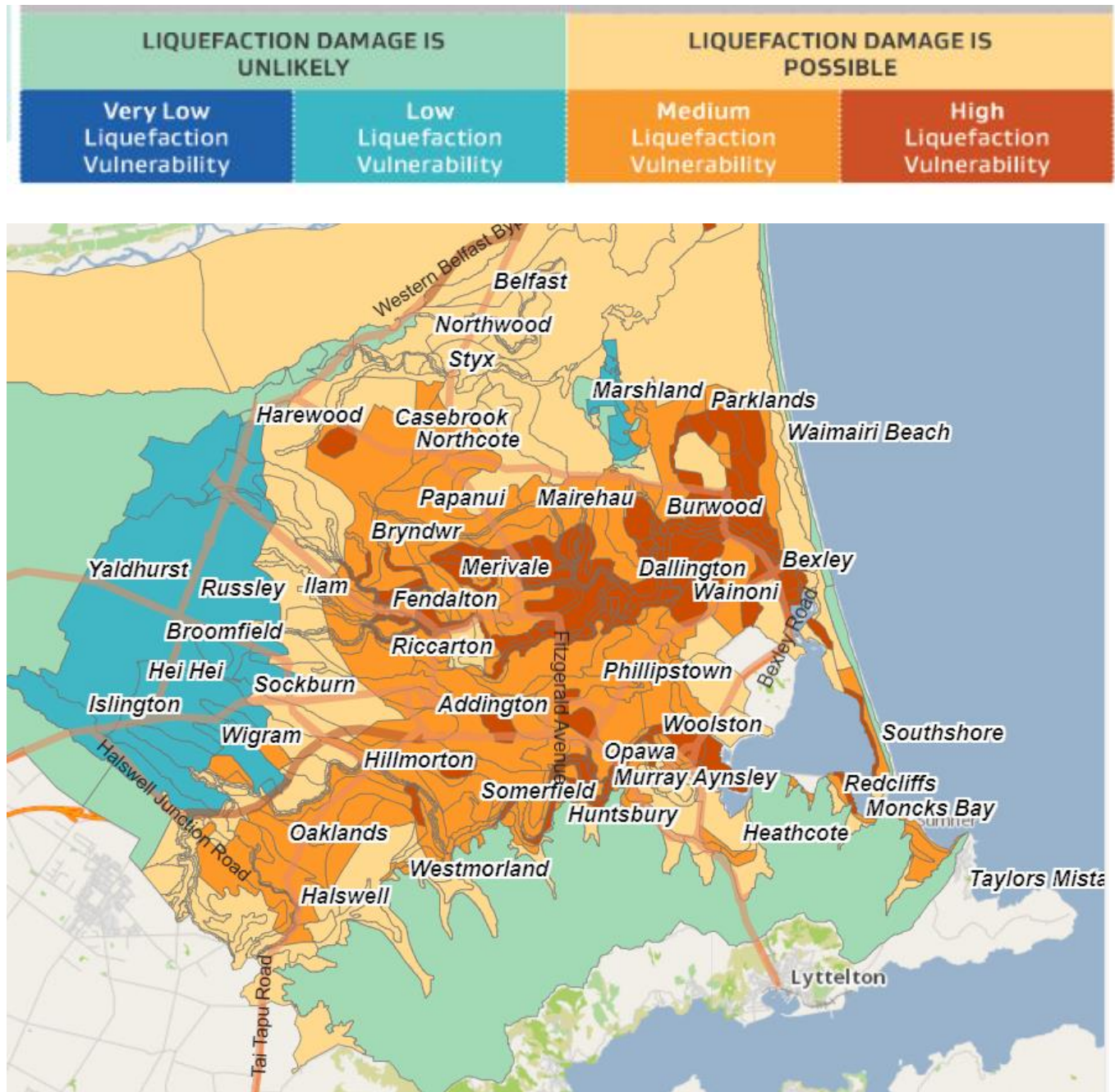


Plan Change 14 should be written to ensure the retention, and protection of the existing natural environment and the dwindling tree canopy coverage of Christchurch. It should allow for people and nature to prosper, rather than being focused on accommodating the short-sighted demands of politicians and the economic gains of developers whose businesses operate without an Environmental and Ecological Code of Ethics.

The Liquefaction City

If you take a shovel, you don't have to dig too deep before you hit the water table on which Christchurch floats.

As a result of the high-water table, and what occurred during the Canterbury Earthquakes, the Christchurch City Council commissioned the following map, revealing the vast majority of properties in Christchurch are vulnerable to liquefaction damage. This includes many parts of Christchurch which have seen enormous volumes of housing intensification, and which the Council have earmarked to enable for far more development to occur.



Liquefaction damages roads, rail and port infrastructure. It damages underground services, stormwater and sewer pipes, and is potentially contaminated as it is ejected out of the ground.

It causes ground cracking and lateral spread which subsequently damages bridges and stop banks. It increases flooding, discharges as sediment into waterways, damages buildings, and as we've seen in Christchurch, forces the displacement of entire communities.

The Flood prone City

As little as 30mm of rainfall is all that is necessary before we see surface flooding building up in Christchurch.

Current projections show that in less than 80 years about 35% of Christchurch will be inundated and vulnerable to regular flooding. Low-lying areas of the city are most at risk, and they are not just coastal areas. The Flockton Basin and suburbs in central Christchurch that are earmarked for accelerated intensification, such as Edgware and St Albans are faced with flooding related issues.

History has shown that the Christchurch landscape was dramatically changed by the sequence of earthquakes and violent aftershocks. 83% of central and eastern Christchurch suffered subsidence—in some areas the ground dropped by more than a metre.

The stormwater system of pipes and open channels that had previously worked during storms and high tides became ineffective, putting parts of Christchurch at serious risk of flooding.

The water table under the city is very high and will rise further as sea levels continue to increase.

Niwa meteorologists have also indicated that climate change is making rain events more intense and more frequent in Christchurch, further adding to the water table.

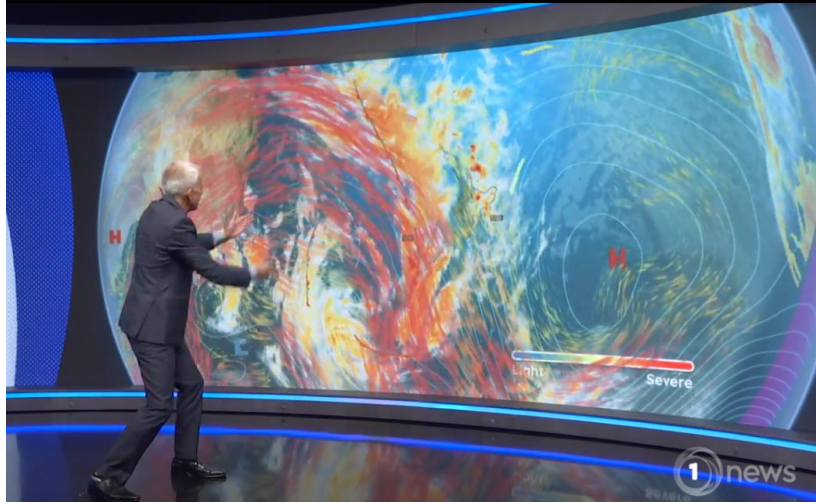
With the ground already saturated and unable to absorb any more water, more frequent and widespread flooding will occur across Christchurch when it rains.

There are no guarantees that widespread land subsidence won't occur again during future seismic events, resulting in further increased flood risk and a repeat of the disruptions, displacement and financial burden place upon Christchurch, her residents and businesses.

Plan Change 14 must consider those facts. It would be reckless and irresponsible for the Christchurch City Council to allowing development to occur in flood prone areas and those that will flood in the future. Increasing the height of foundations and floor levels will not protect residents from having to be rescued from flood-stricken properties, nor the massive costs of repairing them, replacing their belongings, and the untold mental health and wellbeing related issues which will invariably arise.



1 NEWS at Six

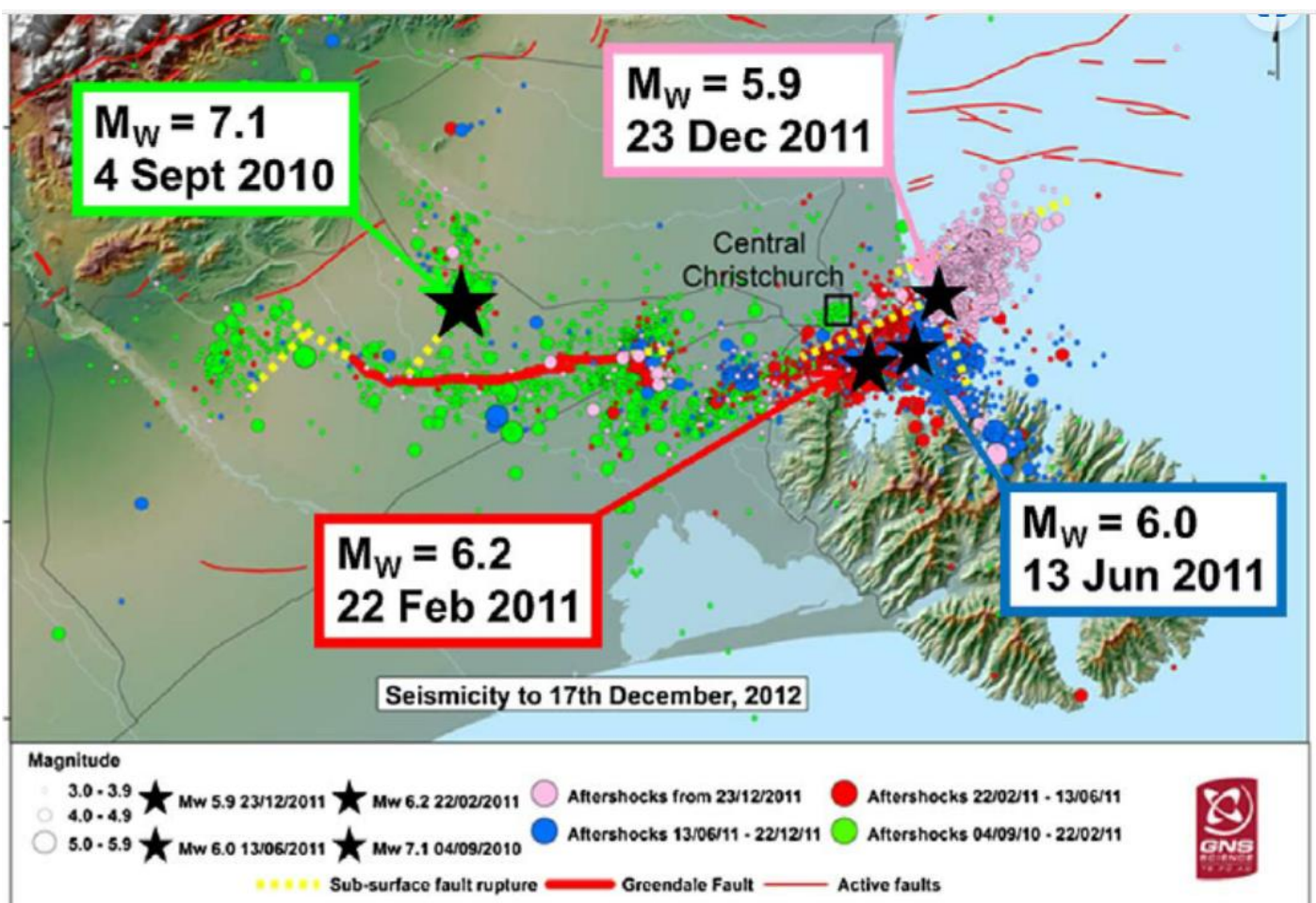


The Fault City

The Christchurch Fault is an active seismic fault that runs under the city from close to Riccarton through to the eastern suburbs and off the coast of New Brighton. It is one of several known fault lines situated near Christchurch, and is believed to have been responsible for the series of earthquakes that shook our city on Boxing Day 2010.

It runs parallel to the more destructive Port Hills Fault which lies a mere 5km to the south. It is believed to have caused the devastating Magnitude 6.3 earthquake on 22 February 2011 which resulted in the death of 185 people, injured more than 7,000, displaced tens of thousands, and had a substantial economic cost estimated at \$40 billion, due to infrastructure and residential damage. There is also no accounting for the toll the earthquake had on the mental health and wellbeing of residents and business owners.

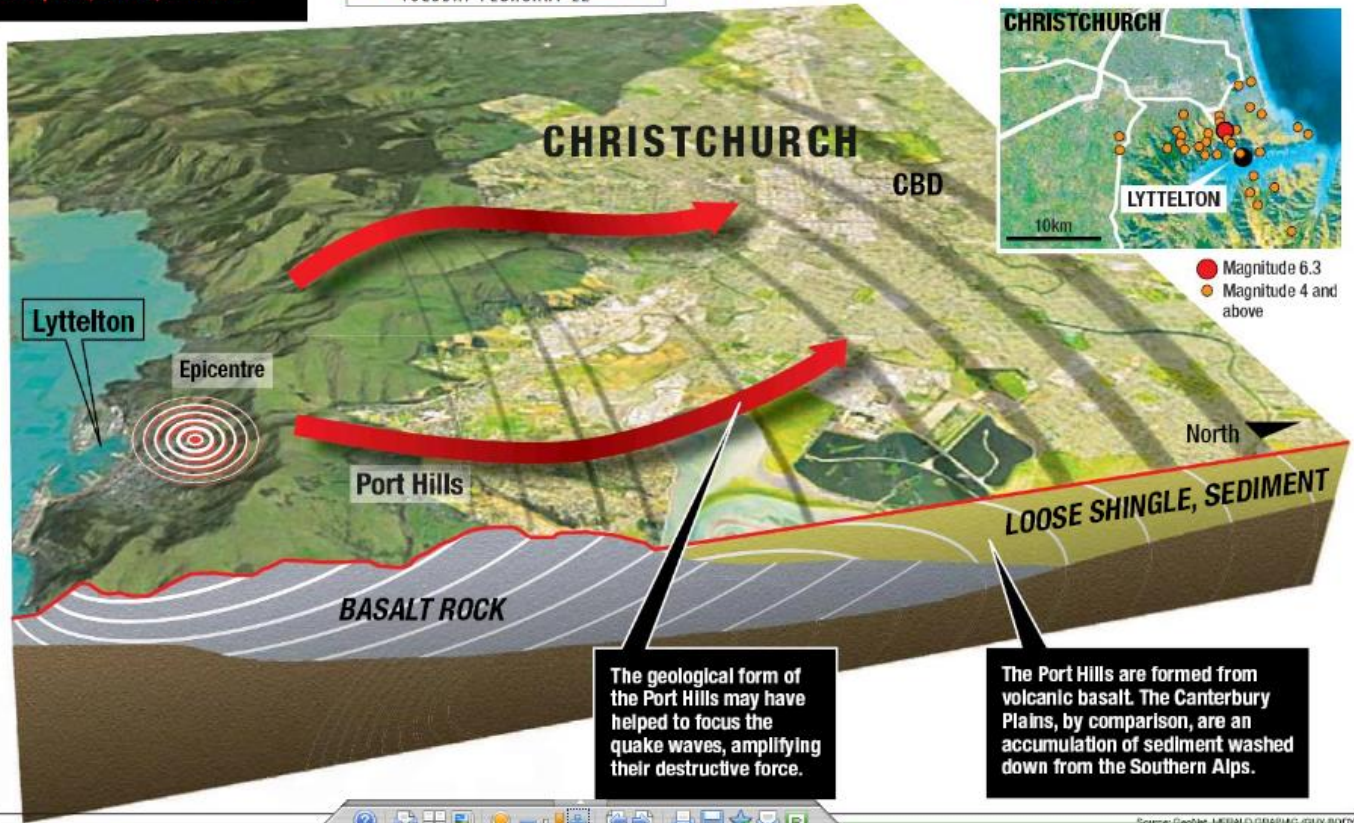
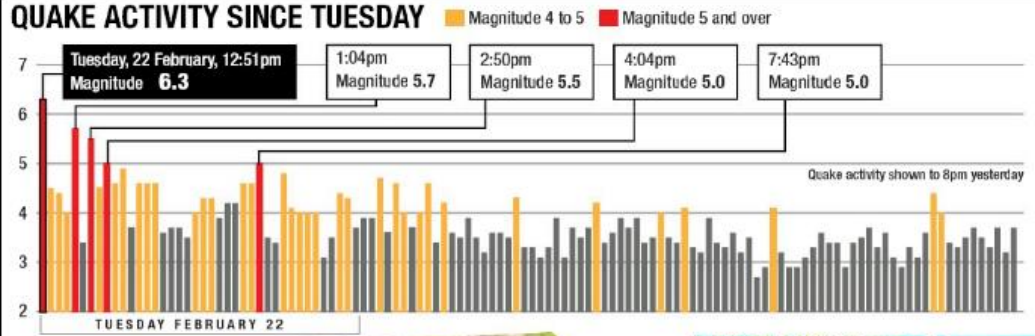
It should be noted that this event was considered to be an aftershock, caused by the previously unknown Greendale Fault which violently shook Christchurch for 40 seconds in September 2010. The Magnitude 7.1 earthquake generated also causing significant land damage, major disruption to critical infrastructure networks, and caused structural damage to residential buildings and extensive liquefaction.



Geologists think the Tuesday quake rebounded off the basalt rock under the Port Hills, compounding the effect of the seismic activity. It then travelled in a wave across Christchurch city. The worst-affected parts of the city probably mark the peaks of the wave.

Seismic activity travels in waves, like sound waves. The waves can compress, refract, or reflect.

QUAKE ACTIVITY SINCE TUESDAY

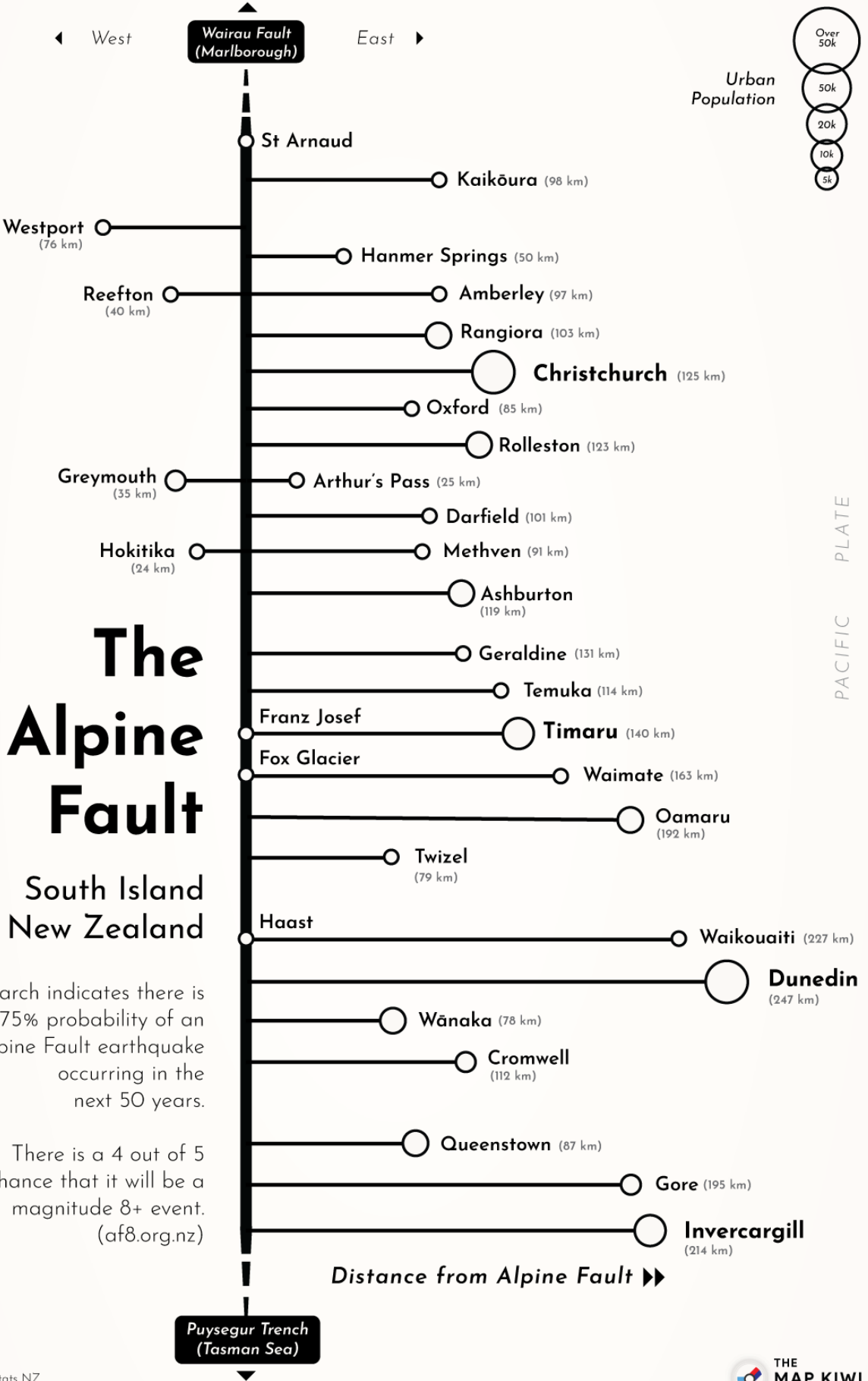


The geological form of the Port Hills may have helped to focus the quake waves, amplifying their destructive force.

The Port Hills are formed from volcanic basalt. The Canterbury Plains, by comparison, are an accumulation of sediment washed down from the Southern Alps.

AUSTRALIAN PLATE

PACIFIC PLATE



The Alpine Fault

South Island
New Zealand

Research indicates there is a 75% probability of an Alpine Fault earthquake occurring in the next 50 years.

There is a 4 out of 5 chance that it will be a magnitude 8+ event.
(af8.org.nz)

Distance from Alpine Fault ▶▶

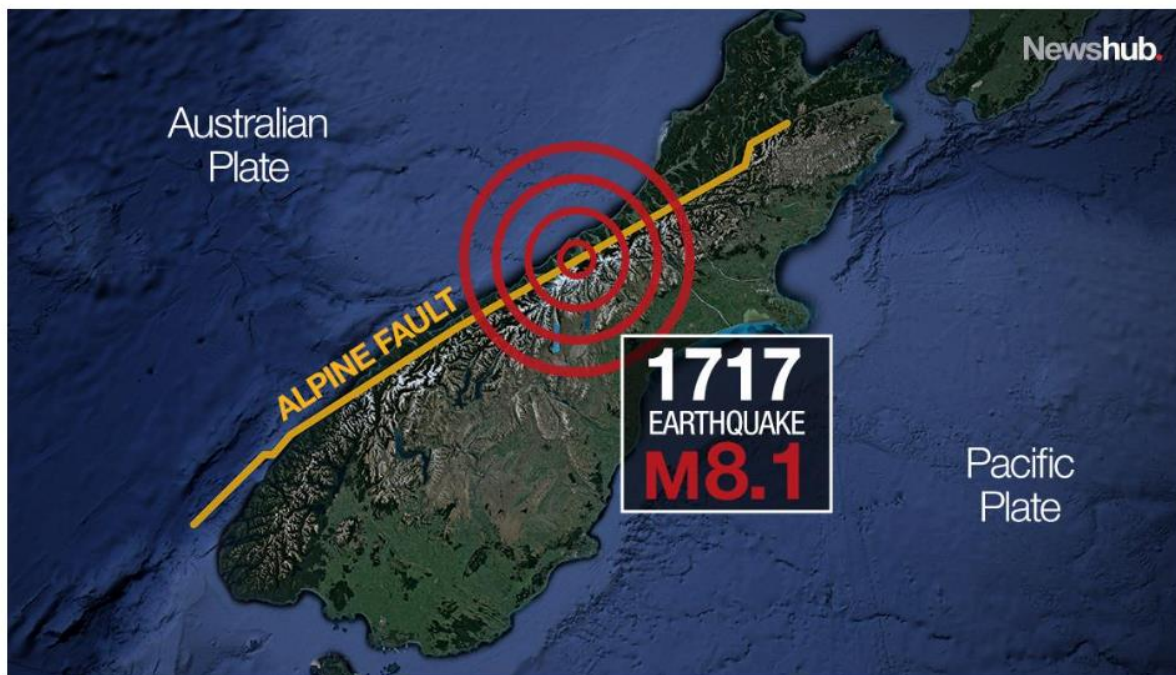


An Alpine Fault rupture may take two minutes to be felt in Christchurch.

History has proven that Christchurch is vulnerable to significant and catastrophic events.

We sit only 100km from the Alpine Fault.

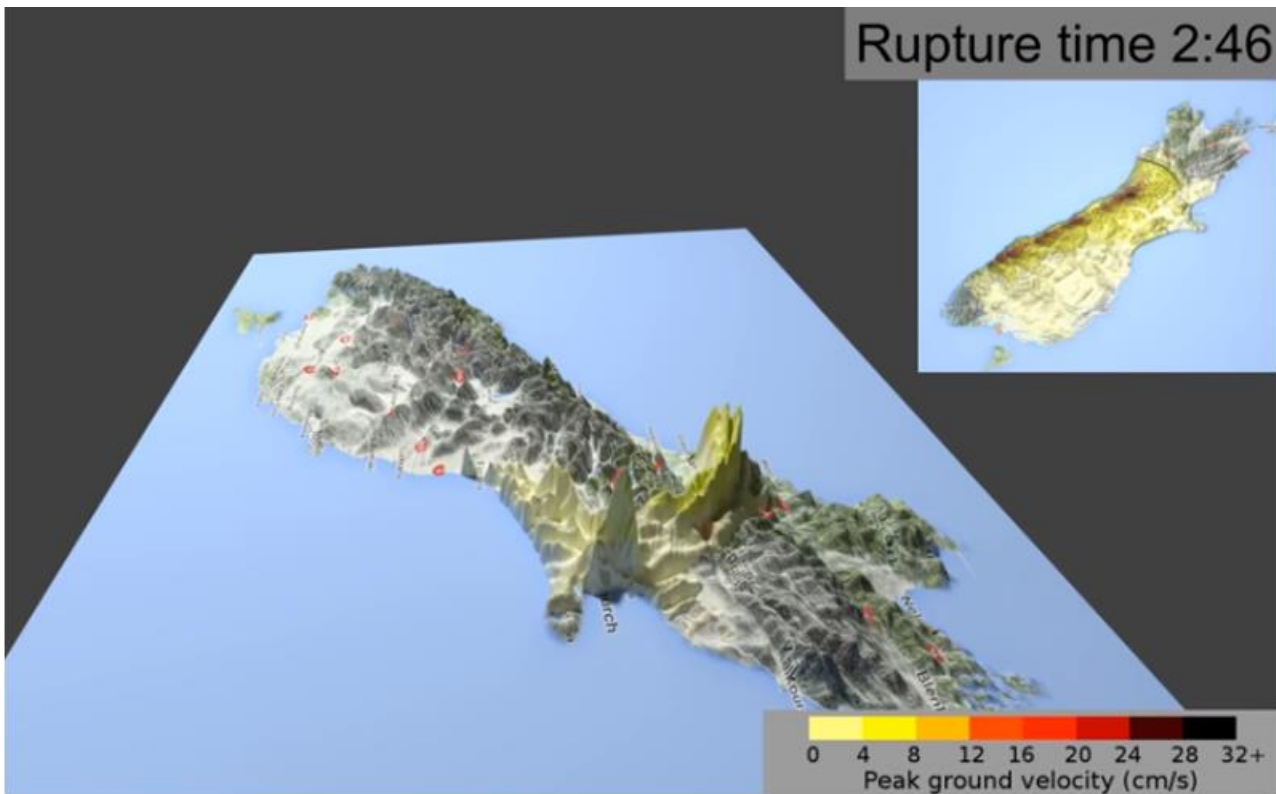
The 600km long active boundary between the Pacific and Australian tectonic plates is one of the most active and powerful fault lines in the world. It is the largest known fault line in the South Island and has the proven ability to generate earthquakes in excess of Magnitude 8. It ruptures about every 300 years. Its last known major rupture was in 1717.



An Alpine Fault earthquake in 1717 moved the fault line by about eight metres. Photo credit: Newshub.

There is a three in four chance of a large magnitude earthquake along the Alpine Fault within the next 45 years, a much likelier prospect than previously thought.

It is not a case of “If” but “When”.



Plan Change 14 needs to give serious consideration to that. The Independent Hearings Panel need to question if the Government have turned a blind eye to that, if they have forgotten the fact that a Magnitude 8.1 earthquake on the Alpine Fault will release about 1,000 times more energy than the Christchurch Magnitude 6.3 earthquake, and that it will be 32 times more powerful than the Greendale Magnitude 7.1 earthquake.

Is the Government's decision to enabling further expansive development in Christchurch a wise decision, particularly when a group of scientists have revealed in a study published in Nature Geoscience that a great earthquake, one of the biggest in New Zealand's modern history, is due?


The research group calculated that when the Alpine Fault ruptures, there is an 82% chance it will be magnitude 8 or higher, meaning major damage is almost certain.

Expert scientific evidence suggests it will cause a long duration of significant ground motion in the Canterbury sedimentary basin, resulting in potentially severe damage and disruption across the entire South Island, along with major economic consequences for the whole of New Zealand.

<https://youtu.be/uGWbjYy3to0>

Modelling suggests that the effects of the Alpine Fault rupturing will lead to a “cascade” of hazards including numerous large aftershocks, landslides, landslide tsunami, landslide dams, landslide dam break floods and debris flows, major damage to the roading network, state highways and bridge, resulting in communities being cut off, and the electricity network losing the ability for power to be generated and transmitted throughout the network due to damage to hydro stations, power pylons and substations, and the fact that access to repair the infrastructure will be very challenging.

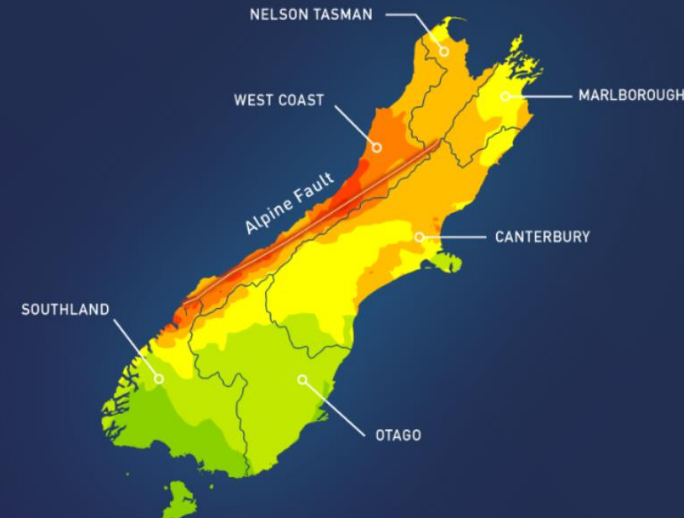
It won't be just one big Alpine Fault earthquake that poses a risk to Christchurch, but also the very large aftershocks, which again is something we as Christchurch residents know only too well how destructive they can be.

 AF8 Hazard Scenario
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[AF8 Hazard Scenario](#)
[The Alpine Fault](#)
[An AF8 Earthquake](#)
[Potential Hazards & Impacts](#)
[Plan & Prepare](#)
[Links & Resources](#)

The Alpine Fault

The next large Alpine Fault earthquake has the potential to cause severe damage and disruption across the entire island, with major consequences for the rest of the country.







- Sand boils, where pressurised liquefied material is ejected to the surface (ejecta).
- Ground settlement and undulation, due to consolidation and ejection of liquefied soil.
- Ground cracking from lateral spread, where the ground moves towards an unsupported face (e.g. a river channel or terrace edge).

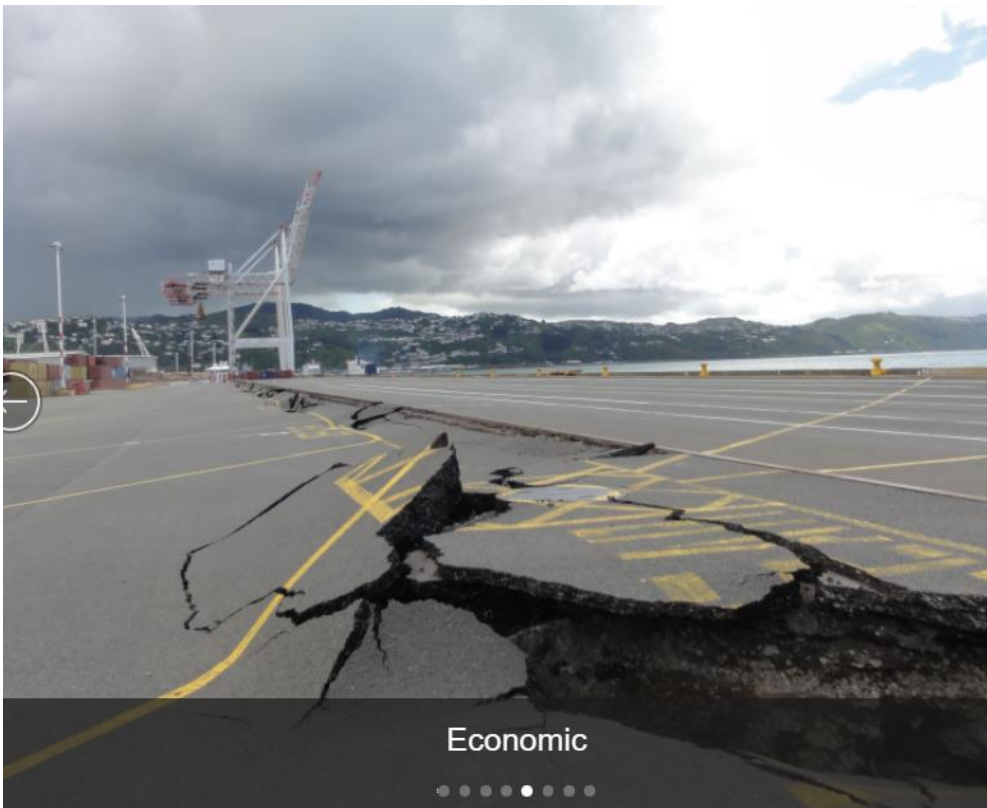


- Damage to road, rail and port infrastructure.
- Damage to underground services, and uplift of underground pipes and tanks.
- Sedimentation and narrowing of waterway channels, damage to bridges and stopbanks.
- Disruption of stormwater drainage.
- Increased flooding due to ground settlement.



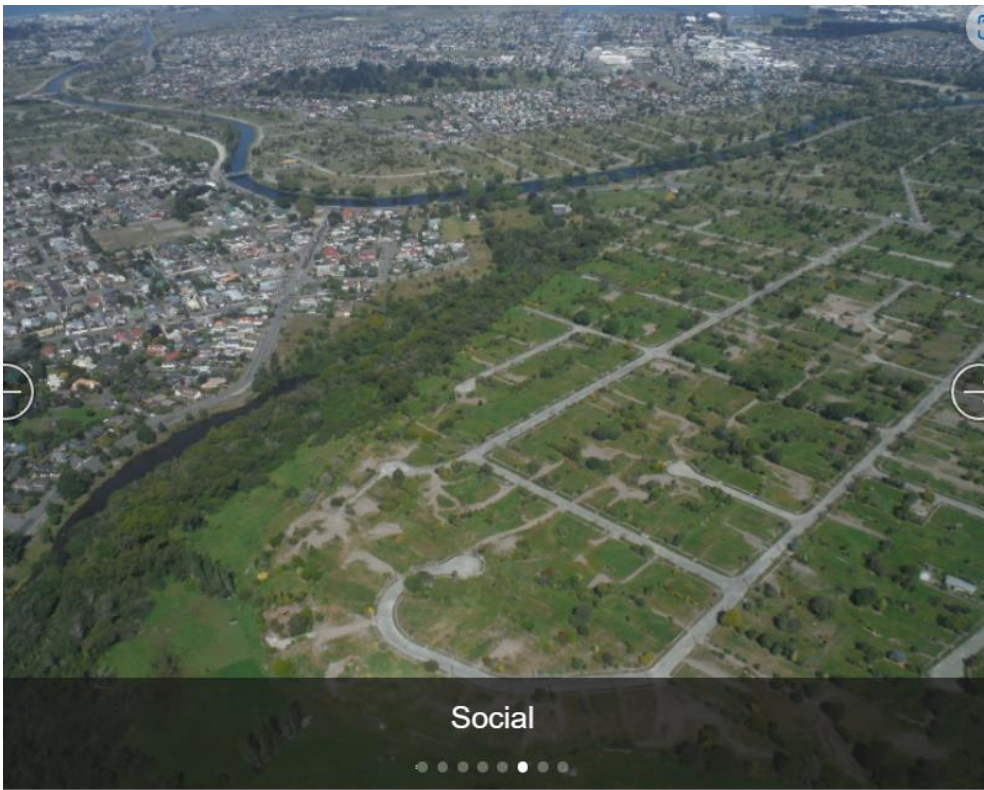
Environment

- Discharge of sediment into waterways, impacting water quality and habitat.
- Fine airborne dust from dried ejected soil, impacting air quality.
- Potential contamination issues from ejected soil.
- Potential altering of groundwater flow paths and formation of new springs.



Economic

- Lost productivity due to damage to commercial facilities, and disruption to utilities, transport networks and supply chains.
- Staff are unable to come to work because they are displaced due to damage to their homes or can't travel because transport is disrupted.
- Cost of repairing damage.



- Community disruption and displacement – initially from damage to buildings and infrastructure, then the complex and lengthy process of repairing and rebuilding.
- Potential ongoing health issues, such as respiratory and psychological health issues.

During and after the earthquake

During the earthquake fine sand, silt and water moves up under pressure through cracks and other weak areas to erupt onto the ground surface. Near rivers the pressure is relieved to the side as the ground moves sideways into the river channels.

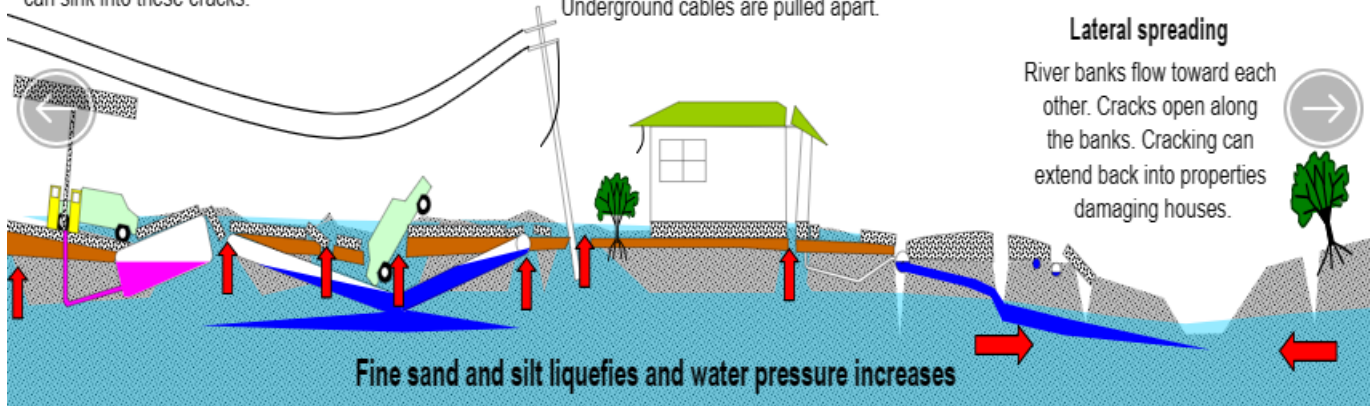
Sand boils (Sand volcanoes)

Sand, silt and water erupts upward under pressure through cracks and flows out onto the surface, heavy objects like cars can sink into these cracks.

Power poles are pulled over by their wires as they can't be supported in the liquefied ground. Underground cables are pulled apart.

Lateral spreading

River banks flow toward each other. Cracks open along the banks. Cracking can extend back into properties damaging houses.



Tanks and pipes float up in the liquefied ground and break through the surface, pipes break, water and sewerage leaks into the ground.

During & after earthquake



Road damage caused by broken pipe



Flooding and lateral spreading damage to power lines



Lateral spreading damage to power lines



Power substation punched into ground



Liquefaction ejecta piles along street



Liquefaction ejecta piles along street



Carport pulled apart by lateral spreading



[Depth To Groundwater | Depth To Groundwater | Canterbury Maps Open Data](#)

[Christchurch Liquefaction Information \(canterburymaps.govt.nz\)](#)
[Liquefaction | Environment Canterbury \(ecan.govt.nz\)](#)

[Meeting the flood challenge in post-quake Christchurch | NIWA](#)
<https://www.stuff.co.nz/the-press/news/131711551/flooding-in-christchurch-impossible-to-fix-report-warns>

<https://www.stuff.co.nz/national/300647943/christchurchs-flood-defence-system-nearly-overwhelmed-in-storm?rm=a>

<https://www.stuff.co.nz/the-press/news/129815555/no-quick-fix-for-flooding-issues-on-christchurchs-edgeward-rd>

<https://www.stuff.co.nz/the-press/opinion/129441673/no-cheap-fix-for-christchurchs-flooding-troublespots?rm=a>

<https://www.gns.cri.nz/our-science/land-and-marine-geoscience/our-plate-boundary/alpine-fault/>

<https://af8.org.nz/af8-scenario>

<https://youtu.be/uGWbjYy3to0>

[The 2011 Christchurch earthquake – Te Ara Encyclopedia of New Zealand](#)

<https://www.newshub.co.nz/home/new-zealand/2021/04/how-a-magnitude-8-alpine-fault-earthquake-would-impact-new-zealand-and-where-will-be-worst-affected.html>

[2011 New Zealand snowstorms - Wikipedia](#)



Cindy Robinson - Chair

Cindy Robinson is a specialist resource management lawyer and an experienced Independent Hearings Commissioner with Chair endorsement.

Commissioner Robinson was a partner at Duncan Cotterill Lawyers from 2000 to 2009. Since that time she has been a barrister and sole practitioner specialising in decision making functions and related advisory roles under the Resource Management, Local Government and Sale and Supply of Alcohol Acts and related legislation.



David McMahon - Deputy Chair

David McMahon has 30 years' experience in urban and environmental planning, representing both public and private interests. He is a founding director of RMG, established in 2001.

Commissioner McMahon relocated to Wellington following the Christchurch earthquakes. His work in recent years has been heavily geared towards commissioner appointments at local council and EPA boards of inquiry level.



Karen Coutts

Karen Coutts has whakapapa connections to several marae across the Ngāi Tahu rohe. She has been, and is active, in Māori and iwi governance, including within Ngāi Tahu.

Commissioner Coutts is a member of the HSNO Committee, Environmental Protection Authority and is a Member of the Otago Regional Council Environmental Science and Policy Committee. She brings a holistic perspective to her work to consider cultural, social, environmental and economic perspectives in the decision-making process.



Alan Matheson

Alan Matheson has 40 years' planning experience in all aspects of resource management planning, primarily as consultant to local councils in the Waikato. He moved to Christchurch in 2012 following the 2011 earthquakes to take up the technical and project lead in the development of the Christchurch Replacement District Plan.



Ian Munro

Ian Munro is an experienced planner and urban designer who has worked across the country, including Christchurch. He holds masters degrees in planning, urban design, environmental law and traffic engineering. Commissioner Munro has worked on thousands of projects ranging from small residential additions up to new neighbourhoods of several thousand new dwellings and major growth strategies.