

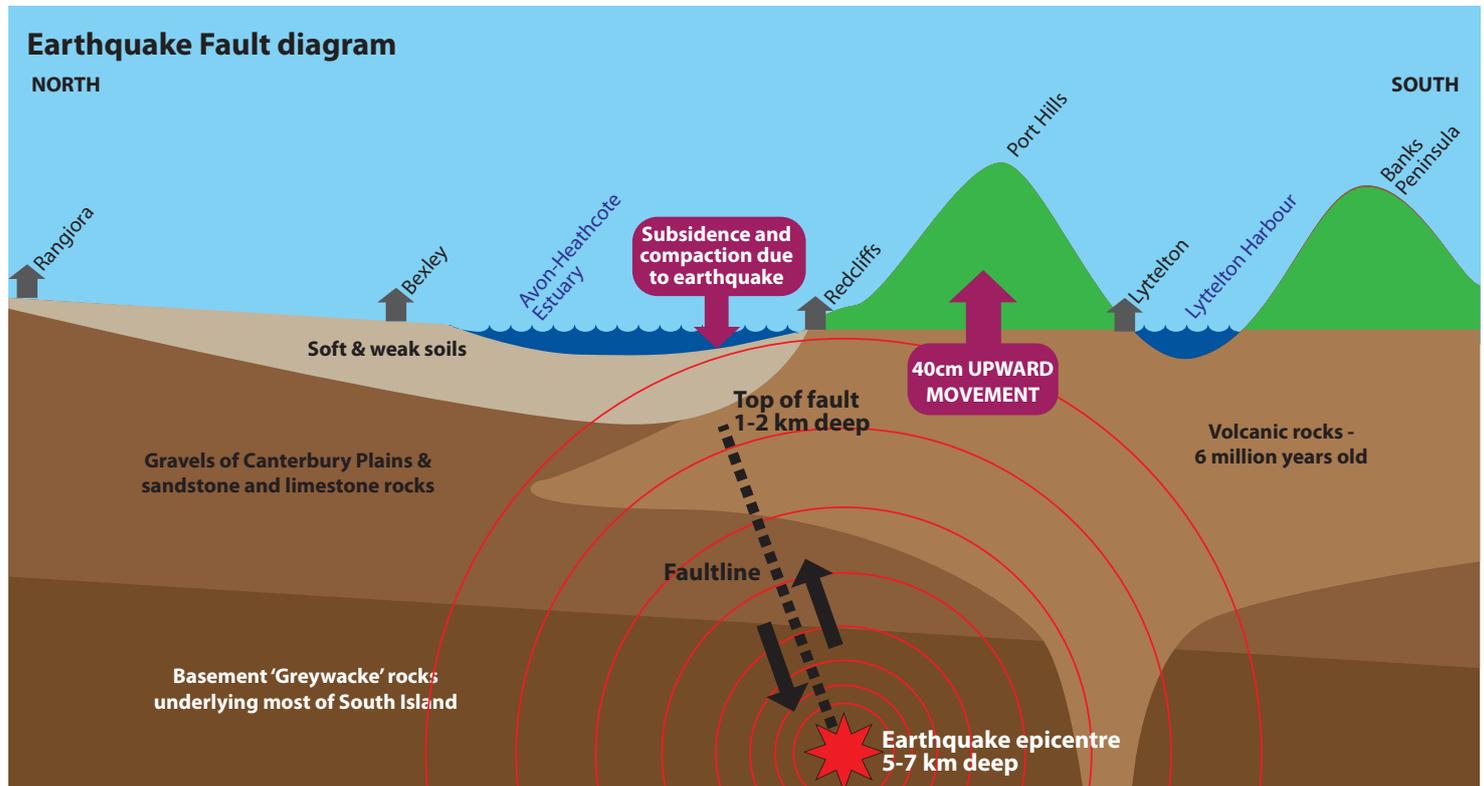
Christchurch

EARTHQUAKE RESPONSE

March 2011

Scientists have been working since the earthquake occurred to understand how it happened and what its effects are. Our understanding will continue to improve as we analyse more information over the coming weeks.

Fault information



- The 22 February 2011 earthquake fault runs beneath the north side of the Port Hills. There is no evidence that the fault broke through to the surface like the Greendale Fault that caused the 4 September 2010 earthquake.
- The fault itself is not vertical. It slices through the ground on a 65 degree angle, back under the Port Hills, with the highest part of the fault lying approximately one-two kilometres beneath the Avon/Heathcote Estuary.
- The two sides of the fault have moved past each other ("slipped") by about 1.5 metres. The direction of slip has caused the Port Hills to rise by about 40 centimetres.
- This earthquake has been followed by its own set of aftershocks. These are becoming less frequent, but will continue for at least several weeks before dropping to pre-22 February levels. This is normal and expected.
- There was no tsunami associated with the earthquake because it happened on land, and involved no displacement of the sea floor. If a further earthquake, even up to the size of the 4 September 2010 earthquake, was to happen offshore any resulting tsunami would be much smaller than the recent Japanese tsunami. It would likely only affect beaches and estuaries in Pegasus Bay and Banks Peninsula and create currents that could affect boats.

As for anywhere in New Zealand, if you are on the beach and feel strong shaking for more than 20 seconds, you

- should move off the beach and away from low-lying areas.
- The likelihood of another large earthquake in the Christchurch area now, and perhaps for the next few years, is similar to that in the West Coast, Marlborough, Wellington and Hawkes Bay.
- The earthquakes that have occurred in other parts of the country and in Japan over the last weeks have not been triggered by this earthquake or its aftershocks. The recent huge earthquake in Japan or other large events elsewhere in the Pacific region will not trigger earthquakes in New Zealand.
- Cracks seen in the ground are not faults. They are where the ground has cracked, often because of liquefaction or landsliding, during the earthquakes. These cracks only go down to a depth of several metres at most.
- Banks Peninsula is an extinct volcano and the earthquake activity is not related to it. Volcanic earthquakes are very different in style to the 4 September 2010 and 22 February 2011 earthquakes. More water than usual has been measured flowing from the warm springs in the Port Hills area since the 22 February earthquake, but the temperature of the springs has not changed much. Similar changes to warm and hot springs have been observed throughout the South Island, as they were after the 4 September 2010 and previous large earthquakes.

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Landslides and rockfalls

- The 22 February 2011 earthquake caused many rockfalls across the Port Hills and created cracks in the soil and rock, particularly between Cashmere/Governors Bay and Godley Head. Geotechnical engineers have been mapping and assessing landslides and rockfalls across the Port Hills, and are monitoring the areas of greatest concern.
- A number of houses in areas where there is a risk to life from rockfalls or landslides have been red placarded. If your house has been red placarded for geotechnical reasons you cannot live in the house for the time being, even if it is structurally sound. You can return to the house for a short amount of time to retrieve important items but you must be accompanied by a chartered professional engineer who has geotechnical expertise. It is likely that you will not be able to return to live in your house for at least one month, possibly longer.
- For more information on landslides and rockfalls, and what to do if your house is red carded for geotechnical reasons, we have also produced a landslide and rockfall factsheet for hill suburb residents. It is available at www.canterburyearthquake.org.nz under "FAQ" or at your nearest Recovery Assistance Centre.
- If you have concerns about landslides or rockfalls affecting your house or your neighbours' houses, please contact Christchurch City Council on 03 941 8999. If the situation appears to be life threatening, please call emergency services on 111.

Flooding risk

- Parts of the Waimakariri River stopbanks downstream of State Highway 1 were further damaged in the 22 February earthquake, mainly through shaking and cracking damage rather than liquefaction damage. At present there is approximately one in 15 year protection for this area (enough to carry about 2500 cumecs of water). The repairs from the 4 September 2010 earthquake have been reprioritised and the worst affected areas are being repaired to improve the level of flood protection again as quickly as possible. Flood protection upstream of State Highway 1 has not been affected and remains at one in 500 years.
- Stopbanks on the Styx, Avon and Heathcote rivers are all being surveyed for damage. There is some damage to parts of the lower Avon stopbanks, and evidence of sinking of the ground due to liquefaction in this area. The lower Avon stopbanks are being built up with earthworks and sandbagging where necessary.

- The Halswell river and drainage system only suffered a small amount of damage compared to the 4 September 2010 earthquake. Some of the side drains of the river have silted up and these will be dug out relatively quickly. Other minor repair work can be incorporated into the existing repair work programme from the 4 September 2010 earthquake.

More information:

www.canterburyearthquake.org.nz
<http://twitter.com/ChristchurchCC>
Christchurch City Council: (03) 941 8999
Canterbury Business Recovery Group 0800 505 096

Earthquake Government Helpline: 0800 779 997
Earthquake Commission (EQC): 0800 326 243
Orion (electricity): (03) 363 9898
Housing NZ Emergency Assistance: 0800 435 700