

Text book aftershock sequence, seismologist says- 10/09/2010

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The number and size of aftershocks in Canterbury is in line with expectations for a main shock of magnitude 7.1, a seismologist said today.

The frequency of aftershocks is already declining rapidly, but they are likely to continue for some time yet, GNS Science seismologist Warwick Smith said.

Seismologists are able to estimate aftershock behaviour by studying aftershock sequences from previous large earthquakes in New Zealand.

"What we are seeing in Canterbury is pretty much a textbook aftershock sequence. They won't get smaller in a hurry, but they are already getting much less frequent," Dr Smith said.

As the aftershocks continued, seismologists were able to improve their understanding of this particular sequence and refine their estimates of how long it could continue.

"There is still a possibility of an aftershock larger than those experienced so far, but the chances of this happening are decreasing by the day."

Aftershocks are a consequence of the stresses developed in the rock surrounding the main earthquake rupture. As aftershocks occur the stress regime changes and expands outward from either end of the main fault rupture.

This loaded up new areas and produced an expanding pattern of aftershocks that occur at a lower rate.

In this way, the aftershock zone had expanded progressively further east and west of the visible fault rupture and was now over 60km-long.

Dr Smith said the Canterbury earthquake and its aftershocks had been extremely well recorded by the permanent network of GeoNet seismic instruments operated by GNS Science and funded by the Earthquake Commission.

In addition to this permanent network, Scientists from Victoria University of Wellington, GNS Science, and Stanford University in the United States had deployed temporary instruments in Canterbury to increase the amount and precision of data being recorded.

This would enable a better understanding of the pattern of aftershocks.

"Since last weekend the instruments in these networks have captured a large amount of high quality data that will be extremely valuable for understanding earthquakes and their impacts on New Zealand towns and cities."

Social Scientist Julia Becker, of GNS Science, commented on how well Cantabrians had coped since last Saturday's main shock and the ongoing aftershocks.

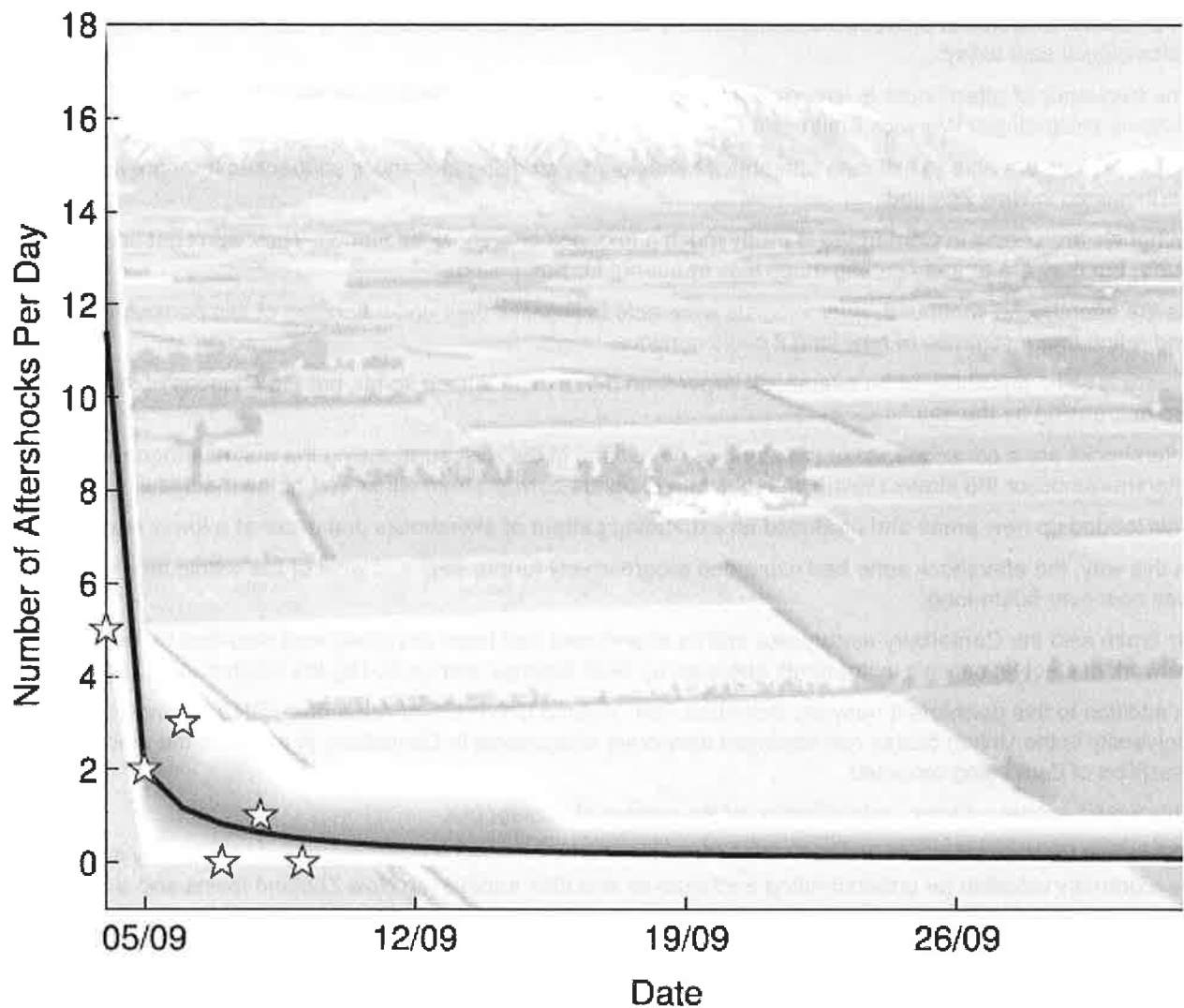
"People should continue to look out for their family, friends and neighbours to provide mutual support, keeping in mind those needing special assistance – the young, the elderly, those without transport, and people with disabilities," Ms Becker said.

People could also reach out for the support available from the local community, government agencies and other organisations.

"People should also remember that if you are inside when the shaking starts, move no more than a few steps to a safe place and drop, cover and hold," she said.

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Modelled Daily Number of Aftershocks Greater Than Magnitude 5



This graphic shows the modelled number of aftershocks of magnitude 5 and greater per for the next month following the magnitude 7.1 Darfield earthquake. The black line is what scientists have modelled as the average daily expected number of aftershocks.

On most days, the number of magnitude 5 or larger aftershocks should fall within the blue shaded area. The yellow stars show the number of actual aftershocks on each of the first five days following the main shock. In the next seven days the model forecasts roughly 14 aftershocks of magnitude five or greater.