update

NIWA
Taihoro Nukurangi

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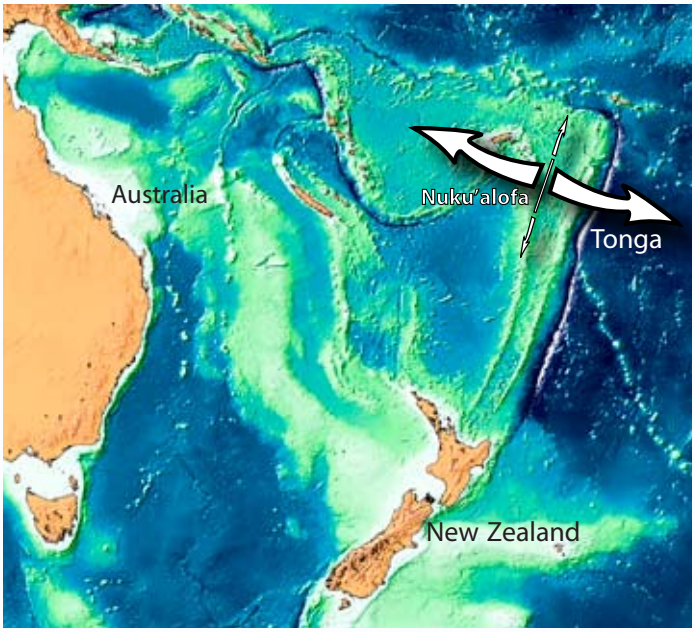
Natural Hazards

setting the foundation for a safer future

The Tonga quake: New Zealand was never in danger

NIWA scientist Dr Roy Walters says New Zealand was never in danger of being hit by a tsunami following last month's magnitude 7.8 quake in Tonga.

The quake happened on the subduction zone at the north end of the Kermadec boundary between the Pacific and Australian plates. 'An event of that size has about a 4 m displacement on the fault surface, which gives about a 1 m displacement of the water surface for the initial wave. It would generate a long wave, with a crest lying in a northeast direction. When the wave propagates away it goes perpendicular to this, in a northwest and southeast direction. The height of the wave coming off the ends and directed toward New Zealand would be minimal', says Dr Walters, who specialises in tsunami modelling.



Dr Walters urged New Zealanders to heed tsunami warnings and says if people on the coast feel a really big earthquake, they should head for higher ground. NIWA modelling of locally generated tsunamis suggests that in some places the first wave would arrive minutes after a quake or undersea landslide, and the sea does not always retreat first.

Why was there a warning but no tsunami?

The first bulletin issued by the Pacific Tsunami Warning Center is usually based only on seismic information. This gives authorities more time to respond, but does mean they get 'false alarms'.

Then the PTWC checks water level data from automatic tide stations near the epicentre of the quake. If a destructive tsunami has been generated, the Center extends or upgrades its previous bulletins. If no or only a very small tsunami has been generated, the previous bulletins are cancelled. In the case of the Tonga event, the largest recorded wave height in New Zealand was only 25–30 cm in Gisborne, Lyttelton, and Chatham Islands.

www.prh.noaa.gov/pr/ptwc/bulletins

What's happening about a New Zealand tsunami warning network?

The development of the sea level component is proceeding under the leadership of Land Information New Zealand (LINZ). GeoNet will provide the seismic information and combine it with sea level data to confirm if a tsunami has indeed occurred. NIWA is currently working with LINZ to establish the feasibility of operating sea level gauges in strategic but often remote locations that offer the earliest possible warning. This would include offshore islands such as Raoul, Norfolk, and Chatham Islands. LINZ is expected to start funding gauge installations later this year. The aim is to link into the Pacific and Australian warning networks, swapping sea level and seismic data with them.

7th Natural Hazards Management Conference

From Science to Practice:
Interpreting & Applying Natural Hazard Information

Town Hall, Christchurch
23–24 August 2006
Optional workshops & field trips 22 & 25 August

More information is available from:
www.naturalhazards.net.nz/courses
or contact:
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NZCoast: tool for coastal hazard management

A project to classify the entire open coast around New Zealand will help identify coastal hazard 'hotspots'.

A prototype of NIWA's GIS-based classification, NZCoast, is now under development and should be on the web by October. NZCoast will give coastal managers robust, initial information at a regional and national level about what their coastline is like and whether it is eroding or accreting. For instance, how many sand beaches are there, which beaches are surveyed, and how vulnerable are they to erosion?

Ultimately, we hope to classify the entire 18 000 km coastline, including estuaries and rocky shores, but the project team has started with the 11 000 km of open coast, unconsolidated shores, and beaches. Data for the classification include geomorphology, beach type, wave and tidal characteristics, and hinterland characteristics mined from a host of sources.

For beaches, we are collaborating with the University of Sydney and Professor Andy Short, who spent 17 years mapping and classifying Australia's 10 685 beaches. Professor Short will be visiting NIWA soon to help apply to, and adapt for, New Zealand the Australian classification system for identifying beach hazards to users (such as rip currents). He will also develop a global classification by incorporating New Zealand beach types.

NZCoast is funded by the Foundation for Research, Science & Technology, with the support of regional councils. Many council and university staff, and other local experts, are generously contributing their expertise to the project.

Hazard overview provides peace of mind

An overview assessment of potential natural hazard risk can be a useful exercise for firms developing industrial sites.

Fisher & Paykel Healthcare asked NIWA and GNS Science to look at the potential risk to its development at Maurice Paykel Place in southern Auckland.

The study found that significant risks posed by extreme sea levels, tsunamis, volcanoes, and earthquakes were minimal.

The general findings included:

- There is no identifiable significant risk of coastal flooding due to storms or tsunamis affecting the built infrastructure, and future earthquakes are unlikely to change that situation.
- The buildings are unlikely to experience significant earthquake damage.
- The return period for an eruption within a 3 kilometre radius of the site is about 20 000 years. Ashfall from an eruption further away could disrupt business on return periods of 100 to 10 000 years, but structural damage is unlikely.

The Fisher & Paykel Healthcare site in southern Auckland: minimal risk of destructive tsunamis, volcanic eruption, damaging earthquake, or extreme sea levels.

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