

NIWA Natural Hazards

setting the foundation for a safer future

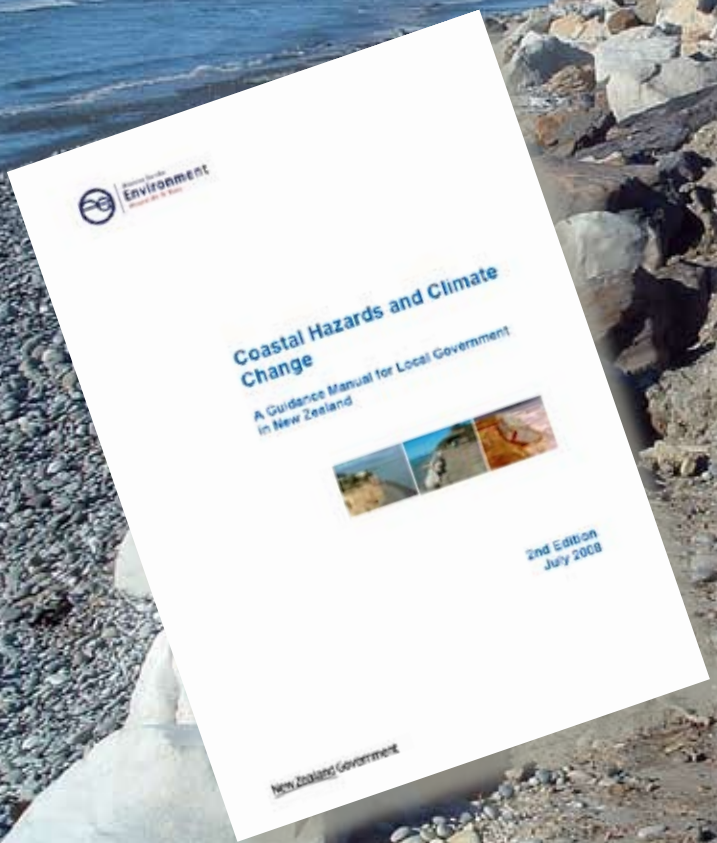
Coastal hazards and climate change

The Ministry for the Environment has released the second edition of *Coastal Hazards and Climate Change – A Guidance Manual for Local Government in New Zealand*. First published in 2004, the manual has been extensively revised and updated by NIWA's coastal hazards team to include the latest guidance on the climate change effects on coastal hazards.

Whilst the effects of climate change effects are gradual, many land-use planning decisions have long-term implications because of the permanency of structures and infrastructure.

Climate change effects must now be considered in all coastal planning. The manual will help local authorities understand the long-term risks that climate change will bring to our coastline and its communities.

Written primarily to support policy, planning, consents, building, and engineering staff within local authorities, the manual provides best practice information and guidance to strengthen the integration of coastal hazards and climate change considerations in land-use planning and during resource consent decision-making.



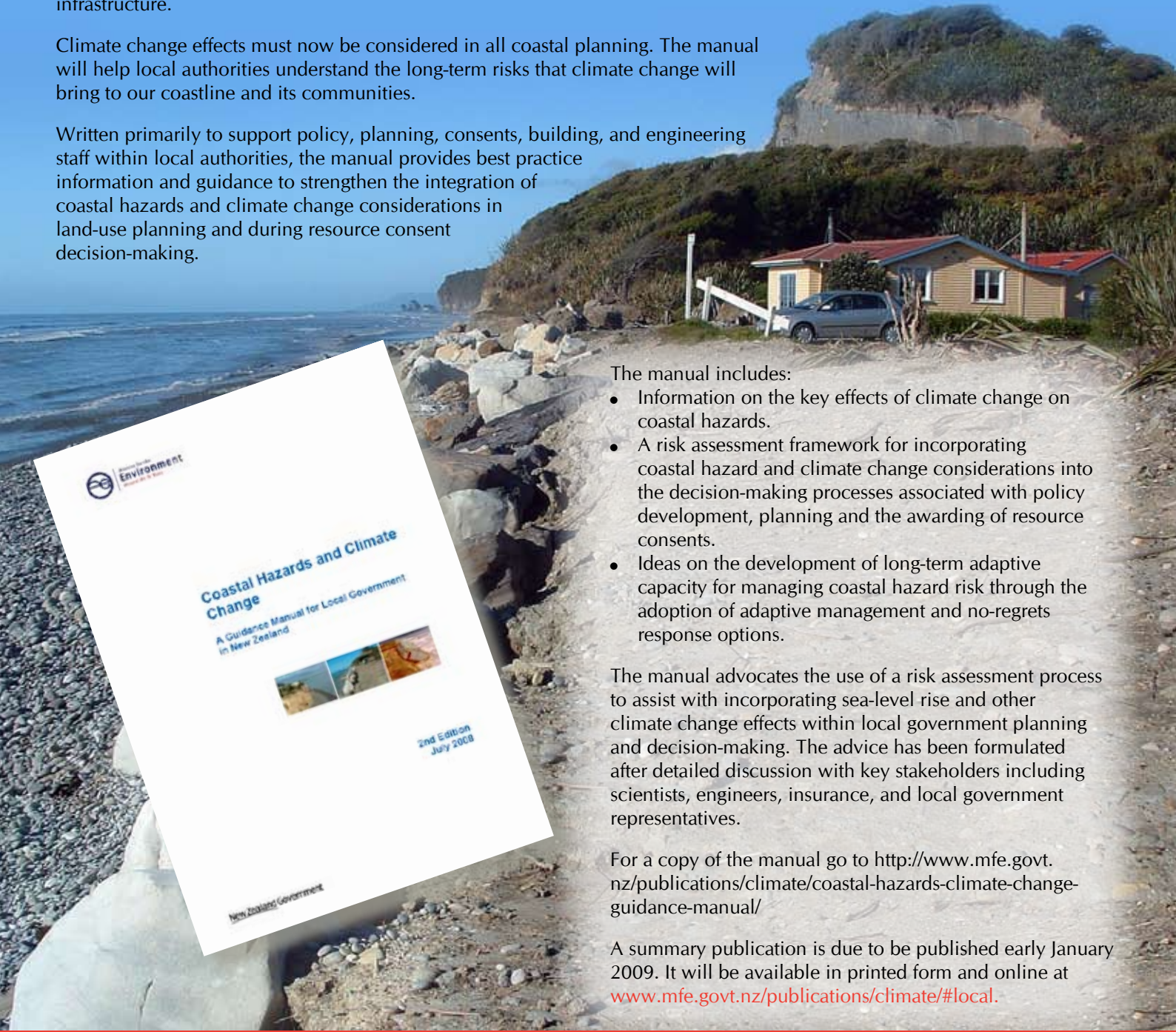
The manual includes:

- Information on the key effects of climate change on coastal hazards.
- A risk assessment framework for incorporating coastal hazard and climate change considerations into the decision-making processes associated with policy development, planning and the awarding of resource consents.
- Ideas on the development of long-term adaptive capacity for managing coastal hazard risk through the adoption of adaptive management and no-regrets response options.

The manual advocates the use of a risk assessment process to assist with incorporating sea-level rise and other climate change effects within local government planning and decision-making. The advice has been formulated after detailed discussion with key stakeholders including scientists, engineers, insurance, and local government representatives.

For a copy of the manual go to <http://www.mfe.govt.nz/publications/climate/coastal-hazards-climate-change-guidance-manual/>

A summary publication is due to be published early January 2009. It will be available in printed form and online at www.mfe.govt.nz/publications/climate/#local.



20 000 years of shaking the seafloor

New NIWA research aims to uncover secrets of long-ago earthquakes on the Alpine Fault and the Hikurangi subduction zone – New Zealand’s two largest earthquake sources. Scientists are going back in time up to 20 000 years to investigate the timing and magnitude of great earthquakes that have occurred along these faults.

We are studying sediment cores, which can be up to 40 metres long, from the seabed. Scientists on a recent RV *Tangaroa* voyage collected short cores from the East Cape, to add to our collection of cores which now covers the west coast of the South Island and the Hikurangi Margin.

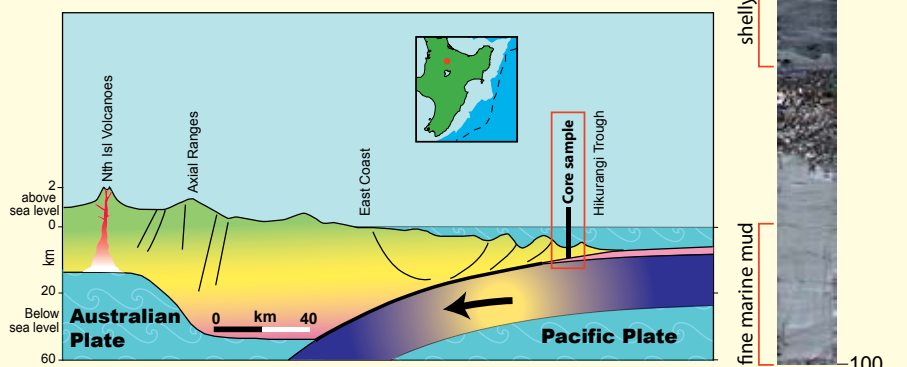
Detailed analysis of the sediment layers within the cores will reveal evidence of mud and debris flows which may have been generated by intense ground shaking associated with great earthquakes. Dating the sediment layers using a range of techniques will enable us to build up a geological time-scale of major earthquakes.

“We know about three historical earthquakes along the Alpine Fault, but otherwise we have virtually no information about how the Alpine Fault and the Hikurangi subduction plate interface behaved in the past” says scientist Dr Geoffroy Lamarche. “The more we find out about the long-term history of the faults, the better we will be able to model the risk they pose to us in the future.”

Cross-section of the North Island north of Taupo, showing the above ground landforms and the deep Australian and Pacific Plates.

*The area of the Hikurangi subduction zone where NIWA scientists extracted sediment core samples while onboard *Tangaroa* is also shown (right).*

The core sample (far right) shows a sequence of sediment or rock layers deposited by underwater currents flowing swiftly downslope. These layers of sediment vary from soft mud to coarse, shelly gravel. Triggers for these downslope cascades of debris include earthquakes; also major climatic events such as cyclones. [Graphic: Geoffroy Lamarche, NIWA]



Aftershock – Would you survive?

Collaboration between NIWA scientist Dr James Goff, and disaster management specialist Dave Neru, led to the recent TV3 tele-feature and reality programmes – ‘Aftershock’. Both James and Dave had seen at close hand the aftermath of the Boxing Day 2004 Indian Ocean tsunami, and agreed that New Zealanders simply are not well enough prepared for a natural hazard disaster.

‘Aftershock’ was a present-day simulation of events following a magnitude 8.2 earthquake in Cook Strait – the same magnitude as the Wellington 1855 earthquake. The terrible physical impact of the earthquake and subsequent tsunami was portrayed, together with the response of emergency services and other groups of people.

‘Aftershock – Would you survive?’ – the second programme – followed the fortunes of a Kiwi family as it endured ‘a long weekend from hell’ – the critical 72 hours following a natural disaster that we all should be prepared for.

NIWA was the lead science advisor to the programme-makers; our hydrodynamics team also produced computer animations of the tsunami’s inundation of low-lying parts of Wellington. The Ministry of Civil Defence & Emergency Management (MCDEM), and other emergency management agencies throughout the Wellington Region are now using these models for training.



On set: simulating a tsunami as it sweeps over State Highway 1, following a magnitude 8.2 earthquake in Cook Strait. A person in the blue car (left) drowns in this scene, as would many others on the road.

[Photo: James Goff, NIWA]

“This project was a great example of how science can provide tangible benefit to the public,” says Dr Goff. “We created a realistic portrayal of what really will happen when a big earthquake strikes. Let’s hope that people who watched will now take steps to become more prepared.”

For more information, contact:

Doug Ramsay

**hazards@niwa.co.nz
0-7-859 1894**

or call free on

**0800 RING NIWA
(0800 746 464)**