

NIWA Natural Hazards

setting the foundation for a safer future

Adapting to erosion on the West Coast

Over the last winter the West Coast of the South Island experienced several significant storm events that caused overtopping, inundation behind, and noticeable changes to a number of beach barrier systems fronting coastal communities. Whilst patterns of coastal erosion and accretion are occurring all the time, people typically become more aware of the issues after episodic events like a bad storm. On the West Coast, as in most other places in New Zealand, there is nothing yet to suggest that erosion is getting worse – changes at the coastline can be cyclic, far from regular, and highly unpredictable.

The West Coast villages of Granity and Rapahoe are two locations where erosion is affecting the local communities. Over the last year, NIWA, under the Envirolink Fund, has been assisting West Coast Regional Council and the communities to outline – realistically – the options for adapting to and managing the erosion. Doug Ramsay, NIWA coastal engineer and Natural Hazards Centre leader, has visited a number of times to talk to residents and council staff. He says: ‘We’re trying to develop consistent, community-based approaches to reduce risk to property or community assets whilst accommodating the ongoing natural changes and trends.’

Most present day issues with coastal hazards in New Zealand are not related to changing patterns or rates of coastal erosion and inundation; they have their origins in development located too close to the sea to accommodate the full range of natural changes and trends. All over the world, attempts to manage coastal erosion are still dominated by reactive responses based on an engineering approach to ‘hold the line’. In reality this rarely solves the problems and can often lead to longer term impacts and issues. Such an approach is certainly not appropriate in many West Coast locations, says Doug. ‘There needs to be a huge shift from simply reacting using ad hoc engineering approaches, to being more proactive and strategic. We need to recognise that the coast is a buffer not a static line. We need to consider carefully where and how people live along the coast, and help them to live with and adapt to these natural coastal changes.’

NIWA’s work on the West Coast is ongoing, with further assistance planned for communities at Hector, Punakaiki, and Cobden.

Beach changes at Rapahoe, looking south from Morpeth Street



November 2005



August 2006

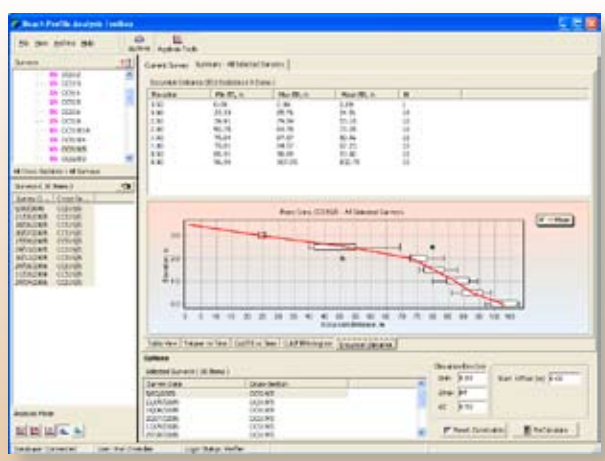


October 2006

Beach Profile Analysis Toolbox available for download now

NIWA’s Beach Profile Analysis Toolbox (BPAT) is an easy to use, integrated package for the input, quality checking, analysis, and archiving of beach and other profile related datasets. The toolbox has been specifically developed to help coastal hazard professionals and researchers to understand variability and trends in beach and nearshore profile data.

For further information and a fully functional demonstration version of the software:
www.naturalhazards.net.nz/tools/bpat



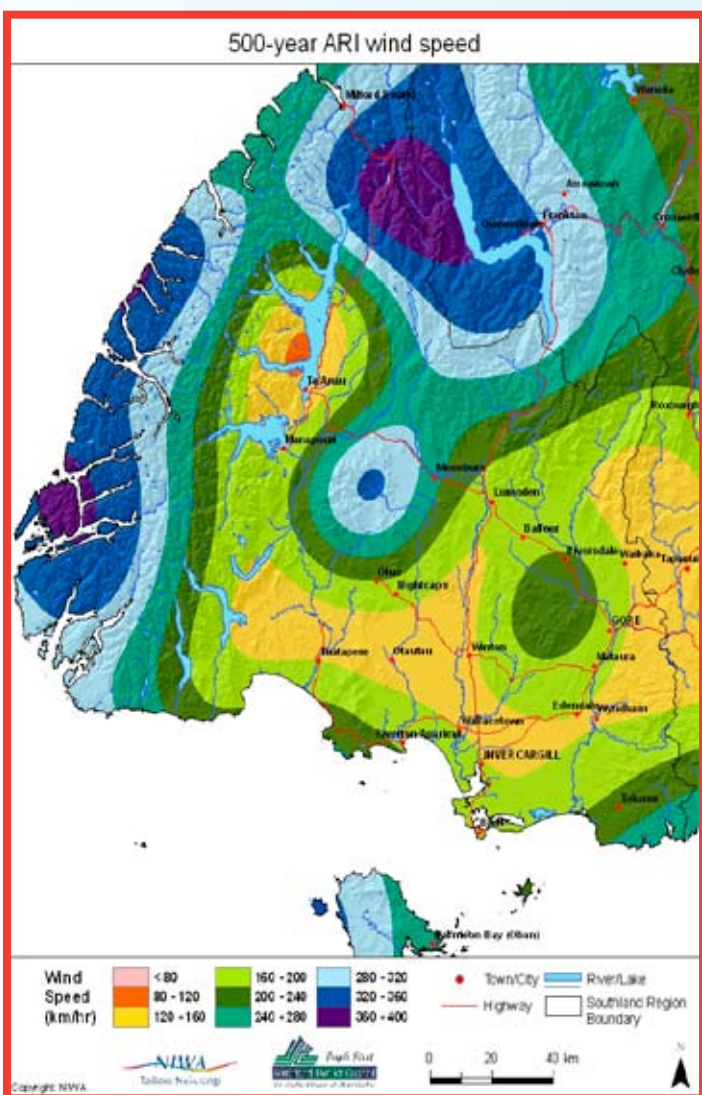
Wild weather in the south

NIWA recently completed an assessment of meteorological hazards in Southland to help the Southland Engineering Lifelines Project assess the vulnerability of key infrastructure and emergency services.

The study looked at extreme wind, snow storms, flood-producing high rainfall, drought/wildfire, and lightning. For each hazard, we

- characterised the weather patterns which produce it,
- described the main impacts on engineering lifeline infrastructure,
- estimated average recurrence intervals and other statistics, and
- outlined what is known about the probable effect of climate change.

As part of the project, we produced a range of maps, like the one shown, for each hazard. The Southland CDEM Group now has GIS layers of these maps to use in its planning.



This map shows the maximum wind gust speeds for a 1-in-500 year event. These are the most extreme wind events considered in this study. The areas with the highest wind hazard in the region are the western and northern Fiordland mountains and western Stewart Island. When considering lifelines, however, the most hazardous areas for high wind speeds are around the Hokonui hills (wind speeds of 200–240 km/h), the Taikitimus (280–360 km/h), and in the southern Catlins (240–280 km/h).

Flood risk mapped for Scandinavian coast

NIWA is playing a key part in providing European insurance and re-insurance companies with postcode-level information on flood risks.

We recently developed and applied a flood inundation model for the whole of the Scandinavian coastal region. The model predicts water extent and depth at a high level of detail and was used to run over 1000 flooding scenarios.

This continues our previous flood modelling work for the principal contractor (HydroGIS-UK) which covered Austria, Hungary, Poland, Slovakia, and the Czech Republic.

It involves merging very large geographic information system databases, including satellite-derived topography (which we heavily reprocess), with pragmatic water routing routines. Other members of the team use our flood model results to calculate 'damage functions', estimating potential costs from different scenarios for different types of business.



Modelled flooding on Scandinavian rivers and coast.

Managing Coastal Hazards

Natural Hazard Centre Short Course 20–21 March 2007

The NIWA/GNS Natural Hazard Centre will present five short courses next year on natural hazards covering coastal, weather and flooding, volcano, earthquake, and landslide hazards, filling a gap between conferences and university courses.

The Managing Coastal Hazards short course covers the various types of coastal hazards and the risks they pose. We aim to improve your understanding of the complex array of hazards that impact on our coast and rapidly expanding communities. This short course is for anyone involved in the management of natural hazards associated with coastal and near-shore waters, including planners, emergency managers, engineers, educators, utility and asset managers, and policy makers.

For more details:

www.naturalhazards.net.nz/courses

or contact Doug Ramsay at d.ramsay@niwa.co.nz

For more information, contact:

Doug Ramsay

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

or call free on

0800 RING NIWA
(0800 746 464)