

NIWA Natural Hazards

setting the foundation for a safer future

Coordinating backcountry avalanche information

The New Zealand Mountain Safety Council (MSC) has again contracted NIWA to coordinate its Avalanche Information Exchange (avalanche.net.nz) over the winter avalanche season. The NZ Infoex provides daily avalanche advisories to the public in popular backcountry recreational areas – Mt Ruapehu, Taranaki, Arthur’s Pass, Craigieburn Range, Mt Hutt/Taylors/Arrowsmiths, Aoraki/Mt Cook National Park, Wanaka, and Queenstown.

NIWA snow and ice scientist, Dr Jordy Hendriks, coordinates the NZ Infoex, ensuring efficient dissemination of daily and weekly bulletins to the public. Jordy works with a team of regional forecasters (contracted to MSC) who are experts in snow and avalanche forecasting, plus mountain guides and other ski and snow industry professionals. These people all share data, assist one another, and provide field observations for the bulletins.



Digging for safety – Jordy Hendriks creates a snowpit in an avalanche start zone, from which snow stability can be assessed.

[Photo: Frank Teichel, avalanche.net.nz]

Jordy also provides hands-on advice on avalanche management, including avalanche control tactics and specific techniques in field observation and documentation. This approach has been useful in developing skills in decision making, an issue that lies at the centre of industry’s needs.

The NZ Infoex has become a useful resource to industry and the public and this year, with a sustained period of unstable snow in many of the regions, this programme has made a real difference for many backcountry travellers. Next time you are out and about in one of these regions keep an eye out for the MSC avalanche danger scale advisory boards located at nearly all NZ ski fields.

More information: www.avalanche.net.nz



[Photo: Jordy Hendriks, NIWA]

*High avalanche risk!
An avalanche advisory board at Treble Cone ski field.*

Towards a national flood forecasting service

Currently, some councils rely only on heavy rainfall warnings to forecast floods. Others predict downstream flows using river gauge data (0–6 hours warning for typical catchments), or rain gauge data (0–12 hours warning).

EcoConnect, NIWA’s environmental forecasting and information service, can now provide up to 48 hours warning of flooding in five catchments: Rangitaiki, Manawatu, Wairau, Buller, and Clutha. EcoConnect runs 24/7 and uses more robust models than past systems. Our New Zealand Limited Area Model (NZLAM) is used to produce rainfall forecasts. NZLAM is a local implementation of the UK Met Office Unified Model™ and is the first high

resolution weather forecast model for the New Zealand region that can incorporate satellite and conventional weather observations, improving the accuracy of the forecasts. NIWA is one of only a few organisations worldwide to incorporate real-time measurements into a hydrological model as well, which again improves accuracy.

Our next steps are to apply this science across every river basin in the country. We hope to produce a genuinely national flood forecasting service by mid 2008.

The research is part-funded by the Foundation for Research, Science & Technology.



[Photo: Alan Blacklock, NIWA]

Taranaki tornado devastation

At about 1.00 pm on 4 July, central New Plymouth was struck by a vicious tornado, reportedly 10 m high, 15 m wide, and described as 'a dark column, with a huge amount of noise, including thunder and lightning'. The town's Placemakers store and racecourse were amongst buildings severely damaged.

However, the tornado on 4 July was just a prelude to the drama that unfolded on the evening of 5 July, when a swarm of at least seven tornadoes struck Taranaki, and a state of emergency was declared. Worst hit was the township of Oakura, where around 40 houses were damaged. Amazingly there were no serious casualties, but the total damage was estimated at \$7 million, to say nothing of the trauma and disruption to people and businesses.

By coincidence, NIWA climate scientists had just delivered a report to the New Plymouth District Council and Taranaki Regional Council on regional risks posed by high winds and tornadoes. On average, Taranaki experiences one damaging tornado a year and a more destructive tornado once in four years – well above the national average, and on a par with Auckland and the Bay of Plenty. New Plymouth District is most at risk in the Taranaki region.

The meteorological conditions which give rise to tornados in Taranaki are now known, and computer modelling may be useful for forecasting future events. NIWA meteorologist Dr Richard Turner stresses that, even when the circumstances appear favourable for a tornado to form, there is no guarantee that this will in fact happen.



*Smashed – a house in Oakura after the tornadoes struck.
[Photo: Peter Scantlebury, New Plymouth District Council]*

Unravelling the Chathams' tsunami history

NIWA scientist Dr James Goff is part of a University of Auckland-funded team working to uncover evidence of historic and pre-historic tsunamis on Chatham Island. The Chathams are right in the path of tsunamis originating from South America and New Zealand. Relatively recent South American tsunamis include one in 1868, where waves of up to 10 m destroyed a settlement at Cape Pattison in northwest Chatham Island, with one life lost.

Substantial geological evidence of large catastrophic events – tsunamis or storms – exists on Chatham Island. This includes layers of pebbles within sand dunes, and boulders scattered across the shore platform at Okawa Point in northeast Chatham Island. The research team took cores from selected coastal sites and material is now being radiocarbon dated and analysed for sediment structure, geochemistry, diatoms, and pollen. When combined, all this will reveal more information about the timing and scale of past tsunamis.

The team has also been liaising with local Moriori to help understand the changes that have occurred to Chatham Island's coast over time. "Linking all the lines of evidence from this work will add immensely to our understanding of tsunamis in history and pre-history, helping us to build up a picture of tsunami incidence over time", says James.

*Possible tsunami evidence: (ii)
Dr. Scott Nichol of Auckland
University inspects boulders on
the shore platform at Okawa
point, Chatham Island.*



*Possible tsunami
evidence: (i) Pebbles
in sand dunes,
~ 10 m above sea
level, Okawa point,
Chatham Island.
[Photos: James Goff,
NIWA]*



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