

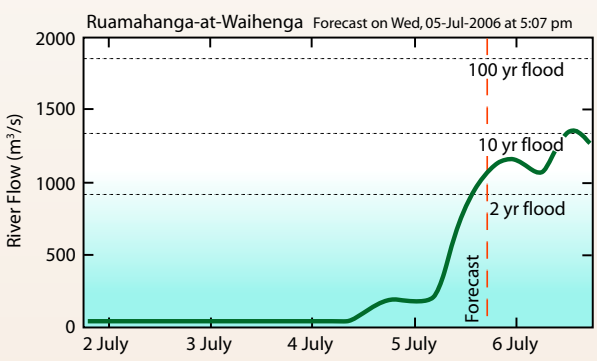
# NIWA Natural Hazards

setting the foundation for a safer future

## Forecasting system passes first 'real life' test

The lower North Island floods of 4–6 July gave NIWA its first chance to test a new environmental forecasting system in operational conditions. Such a system can improve the protection of stock, property, and other assets, reduce insurance costs, and – most importantly – save lives.

During the three days of flooding, we were able to give the Ministry of Civil Defence and Emergency Management good guidance on the expected river flows in the Ruamahanga catchment, Wairarapa. Our forecasts improved on previous estimates for the timing of the flood peaks and predicted maximum flows to within 20 percent.



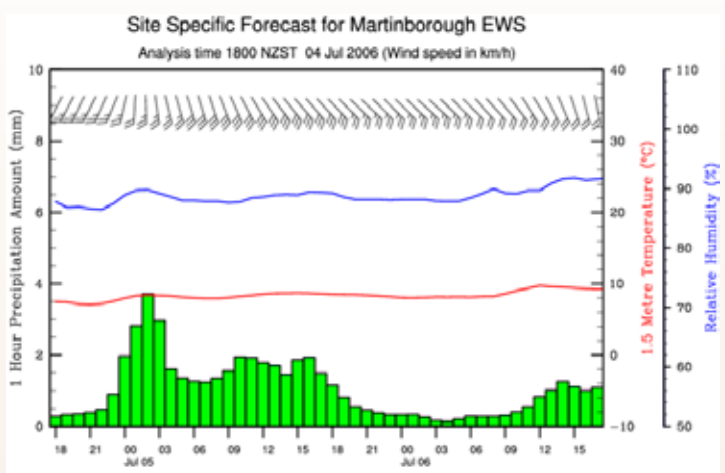
NIWA forecast for river flow, Ruamahanga-at-Waihenga, after 5:07 pm on 5 July, 2006.

The environmental forecasting system is being developed in partnership with the UK Met Office. It involves an operational weather analysis and forecasting model which links into river, wave, and sea level models. The four-year research programme is funded by the Foundation for Research, Science & Technology. We are now halfway through, so the accuracy and capability of the system will improve further as research and development continues.

### Calculating uncertainty

When regional councils and emergency managers receive a flood forecast, they know it won't be correct to the last cubic metre per second. But until now, the tools for estimating how big the range of likely outcomes might be, or what is the best case and worst case, have not been available.

Forecasters don't want to 'cry wolf' too often, nor do they want to risk lives and property by not forecasting a serious flood. This year we have developed and tested tools for calculating uncertainty limits in flood forecasting models we built for the Manawatu and Wairau (Marlborough) rivers.



NIWA forecast for rainfall, temperature, relative humidity, wind speed & wind direction, at Martinborough, after 6 pm on 4 July, 2006.

### Severe but not extreme

The floods which affected the lower North Island over 4–6 July 2006 were caused by a strong winter storm that became slow moving off the Wairarapa coast.

Most maximum rain rates peaked between 4 and 8 millimetres per hour (mm/h). This is not particularly heavy, but lasted long enough to cause trouble. Martinborough received 122 mm of rain over the three days. This represents about a 1-in-20 year event, as does the 101 mm recorded at Wanganui (Spriggins Park). At Masterton, the estimated three day rain total of 181 mm represents about a 1-in-70 year event.



## NIWA coordinates backcountry avalanche information

Dr Jordy Hendrikx  
testing snow stability.

The New Zealand Mountain Safety Council has contracted NIWA to coordinate its Avalanche Information Exchange (InfoEx) over the winter avalanche season.

The council has operated the InfoEx since early 2000. What started as a forum for guides and other professionals in the ski and snow industry to share knowledge about snow stability has grown to a website where the public can submit observations and view backcountry avalanche advisories. The advisories are for Mt Ruapehu, Taranaki, Arthur's Pass, Craigieburn Range, Mt Hutt/Taylor's/Arrowsmiths, Aoraki/Mt Cook National Park, Wanaka, and Queenstown. This information is now also available via cell phone, snowphones, local media, and backcountry avalanche advisory signs at the boundaries of most ski fields.

As part of NIWA's increasing interest in snow and ice research, we recently welcomed Dr Jordy Hendrikx to our team as a NIWA post-doctoral fellow. Jordy has added the role of InfoEx coordinator to his other tasks. Jordy's previous research includes quantifying avalanche risk on the Milford Road, statistical avalanche forecasting, use of GIS in avalanche management, and investigating the relationship between atmospheric circulation indices and snow depth in Fiordland. Jordy will also lead the design and implementation of NIWA's new snow and ice monitoring network.

More information: [www.avalanche.net.nz](http://www.avalanche.net.nz)



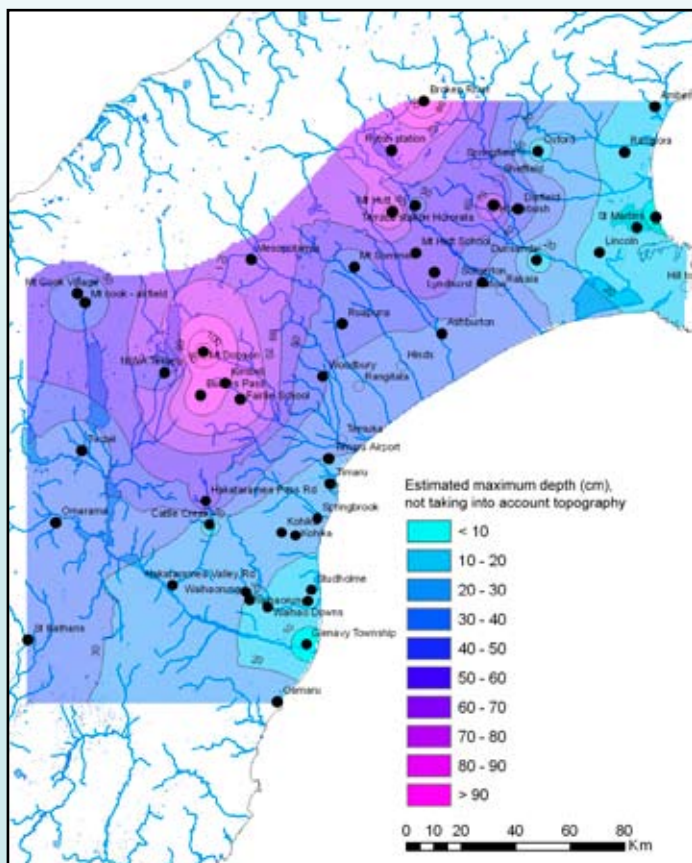
## The big snow

Shortly after the 12 June snow storm in Canterbury and North Otago, Orion New Zealand Ltd asked NIWA to report on the storm's severity. NIWA estimated snow depths across the entire region and compared these to published information on six previous extensive snow storms in Canterbury.

North of the Rakaia River, the snow depths were significant although not unprecedented, but south of the Rakaia, snow depths were extreme in places. In particular, the Canterbury

plains experienced exceptional snow depths. The 12 June snow storm produced greater snow depths than the 1973 and 1967 snow storms. Snow depths throughout this area were similar to those of the big 1945 snow storm and in some areas much deeper. The maximum snow depth for Ashburton (38 cm) broke the record for the town.

The preliminary report is available on-line at [www.niwascience.co.nz/pubs/mr/archive/2006-07-04-1](http://www.niwascience.co.nz/pubs/mr/archive/2006-07-04-1) by kind permission of Orion New Zealand Ltd.



## Managing extreme weather & flooding

### 21 & 22 September 2006, Christchurch

This popular short course covers how weather systems develop, the extent of the resulting hazards, hydrological processes, and how to assess the associated flood risks. It includes practical presentations, hands-on group projects, and a field visit covering various approaches to hazard mitigation. You even get to try your hand at weather forecasting.

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Register on-line at [www.niwascience.co.nz/edu/training](http://www.niwascience.co.nz/edu/training)

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