

Hazardous Times

Hazard News and Views from the Auckland Regional Council



OCTOBER 2003, Volume 7, No. 2 ISSN 1174 0957

The fourteenth issue of Hazardous Times focuses on investigations of the region's potentially active faults, and geomorphological and geophysical work on mudslides in the Tawharanui Regional Park. It also reports on the Cities on Volcanoes 3 Conference held in Hilo, Hawaii, and updates the activities of the Auckland Engineering Lifelines Group and the Civil Defence Emergency Management Group.

Reducing Auckland's Earthquake Risk: Building on or Near Active Faults

Building across an active fault can be a deadly affair. Building codes cannot ensure the structural integrity of buildings situated across faults during large-scale movement. Therefore, the Auckland Regional Council (ARC) hope to provide Territorial Authorities in the Auckland region with sufficient information on the activity of the Drury and Wairoa North Faults to enable them to apply the development guideline recently produced by the Ministry for the Environment (MfE).

Many local authorities throughout NZ are not adequately controlling development on, or close to, active faults. Consequently, MfE developed a guideline outlining planning restrictions that should be enforced around active faults. "Planning for Development of Land on or Close to Active Faults: An interim guideline to assist resource management planners in New Zealand" (available online at <http://www.mfe.govt.nz>) is intended to provide local authorities with clear guidance on the controls that should be employed to protect the public, but do not excessively restrict development.

The ARC is now investigating the major active and potentially active faults of the Auckland region in order to assess earthquake risk. Watercare Services Ltd. have already collected information on the nature and activity of the Wairoa North Fault and recently made this available to the ARC. This investigation determined that the Wairoa North Fault has not been active in the last 16-24 kyrs, however it has been active more recently than 80 ± 15 kyrs. Minimum and maximum recurrence intervals of 13.6 ka and 42.9 ka respectively have been estimated.

The ARC also hopes to undertake further research on the Drury Fault, considered a potential source of large earthquakes. This research will attempt to determine whether the Drury Fault is "active" (ruptured in the last 120,000 yrs) and if it is active, determine recurrence interval and map the fault trace and/or deformation zone.

Information gathered during these investigations will give the local authorities a better understanding of the risk associated with earthquake hazards in the Auckland region. The MfE guideline will allow local authorities to apply consistent and sound land use planning to reduce risk to the public from buildings



View of the Wairoa North Fault forming the western boundary of the Hunua Ranges.

situated in such potentially destructive locations. In addition, this information will increase understanding of other earthquake related hazards in the Auckland region such as ground shaking, liquefaction and shaking-induced slope instability, by providing more accurate assessment of recurrence intervals.

For further information please contact Jane Olsen, ARC by telephone: (09) 366 2000 x8449; or email: jane.olsen@arc.govt.nz

NEWS IN BRIEF

Earthquake Summary

During the past three months, the Auckland Volcanic Seismic Monitoring Network recorded two earthquakes. Both of the earthquakes were recorded in August, but were too small to be felt, measuring magnitude 2.4 and 2.5. The first was recorded on the 5th of August 2003 and was located southeast of Muriwai Beach town-ship at a depth of 9km. The second was recorded on the 26th of August and was located offshore west of Kumeu at a depth of 7km. The earthquakes were tectonic in origin and not associated with volcanic activity.

Wave Climate of the Hauraki Gulf

A project was undertaken in June 2003 by NIWA for the Auckland Regional Council to assist in the characterisation of the wave climate of the Hauraki Gulf. Findings were based on a combination of measurements and numerical modeling. Long-term mean values of significant wave height, peak wave period and velocity were obtained throughout the Gulf, and show a gradation from energetic conditions in the northern part of the Gulf, exposed to oceanic swell, to lower energy conditions in the southern part of the Gulf. These findings can be used for coastal hazards studies.

Mudslides, Tsunami and Tawharanui

Currently, work is being undertaken on a small, well-exposed mudslide in the Tawharanui Regional Park, with the aim of determining the extent and mechanism of movement of the feature. Mudslides are the most common form of mass movement on the Tawharanui Peninsula, north of Auckland, with rates of movement from rapid to slow over decades, and often vary due to fluctuating water levels.

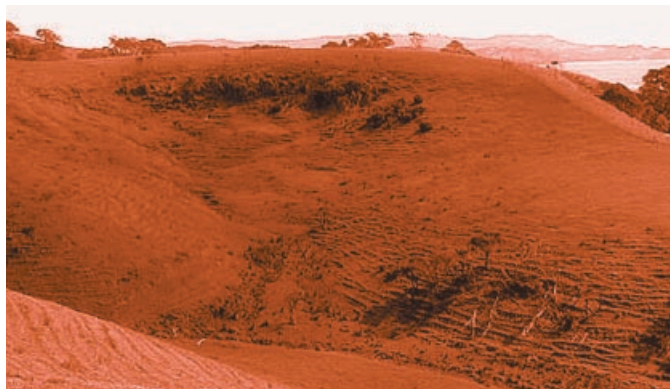
The work involves hand-augured holes and GPR measurements to determine the subsurface structure, and sampling to determine soil properties. Having developed an understanding of the failure, the next step envisaged is to monitor it over an extended period of time in order to establish rates of movement. For this, the Regional Park provides the perfect field site as it allows for long-term access.

Preliminary results suggest that there has been significant movement over the last few

hundred years, as mudslide deposits are found on top of charcoal, which probably represents early Maori occupation. As an unexpected result of the auger work, extensive, thick, very young sand sheets have also been identified, possibly representing tsunami deposits.

The mudslides at the Regional Park represent little risk as most of the area is farmland, and at present the rate of movement appears to have little impact beyond nuisance value. In areas where there are houses developed on these mudslides however, the potential for risk is greater, as movement, even at slow rates, may impact on building foundations. It is well recognised that movement rates are strongly dependent on soil moisture content. Therefore, the potential exists for reactivation and increased mobility of mudslides due to natural and/or anthropogenic climatic change.

For further information please contact Vicki Moon, Dept. of Earth Sciences, University of Waikato by telephone: (07) 838 4024; or email: v.moon@waikato.ac.nz



A small mudslide in Tawharanui Regional Park. This has a typical bowl-shaped source area with steep headwalls, disturbed ground, and disturbed groundwater patterns; a well-defined track or channel; and a low-angled depositional zone at the base of the slope. The depositional zone is characteristically very wet.

AELG Update



Impact of Volcanic Ash on Water Supplies

The Auckland Engineering Lifelines Group (AELG) is just commencing a review of the impact of volcanic ash on the Auckland water supply system. Three key tasks are involved:

- evaluate the potential for physical and/or chemical contamination of water sources from direct ash fall,
- evaluate the potential disruption to water sources/supplies from increased water usage following an ash fall, and
- develop appropriate mitigation options and public information messages to manage supply before, during and following an ash fall event.

The report is due out in November this year.

AELG Annual Seminar

The AELG annual seminar will be held on the 7th November 2003. The guest speaker, Sarah Norman, will speak on "Lifeline Utilities and Terrorism: A UK Perspective."

Volcanic Impacts Study Group

A volcanic impacts study group has been set up as a sub-committee of the AELG. It's primary objective is to facilitate research on the impacts of volcanic hazards on, and mitigation measures for, lifeline infrastructure.

For further information please contact Louise Chick, ARC by telephone: (09) 366 2000 x8903; or email: louise.chick@arc.govt.nz

For further information about the AELG activities please see their website: www.aelg.org.nz; or contact the project manager Lisa Roberts by email: lisa.roberts@meritec.org; or by telephone: (09) 379 1261

Cities on Volcanoes 3 Conference

Build cities on volcanoes? What a crazy idea! Well, Auckland is not the only city in the world that was built right on top of potentially active volcanoes. It is a worldwide problem, which is why there is a biannual international conference to discuss the impacts of volcanic activity on society. Cities on Volcanoes 3 was held on 13-20th of July 2003 in Hilo, Hawaii, 45km from Kilauea Volcano, which has been erupting for the past 20 years.

In addition to sessions on volcanic health impacts, hazards education, volcano monitoring techniques, hazards assessments, response and recovery

operations, and various others, the conference offered full day workshops on 'outreach and education' and 'lava flow mitigation', and field trips investigating the impacts of previous eruptive activity.

If you would like to find out more about the conference, a copy of the abstract volume and field trip notes can be viewed at the Auckland Regional Council Information Centre, or please contact Louise Chick, ARC, who attended the conference by telephone: (09) 366 2000 x8903; or email: louise.chick@arc.govt.nz



In 1990, lava flows from Kilauea Volcano invaded Kalapana, a coastal community treasured for its historic sites and black sand beaches, and although the residents were able to evacuate safely, their homes were destroyed (from USGS Fact Sheet 074-97, v.1.1.).



Auckland Region
cdemg

CDEM Group Update Feedback sought on working draft of CDEM Group Plan

A working draft of the Auckland region CDEM Group Plan has recently been completed and consultation with the key partner organisations: the 8 Local Authorities, Fire, Police, St John and District Health Boards, is presently underway.

The purpose of the CDEM Group partner briefings being undertaken between now and the end of October is to bring staff from the various departments within each organisation up to speed with the Plan, to outline what it means for their organisation and to seek feedback and determine whether:

- the Plan meets their expectations,
- their organisation can achieve the targets specified in the Plan,
- there are any gaps in the Plan, and
- their organisation is planning work that could be included as part of the Plan.

The CDEM Group Plan is mandatory under the new Civil Defence Emergency Management Act (2002). The broad purpose of the Plan is to enable the effective and efficient management of regionally significant hazards and risks.

The Plan is about:

- strengthening relationships,
- encouraging cooperation, and

- seeking commitment to achieve better outcomes.

The working draft Plan has four main sections, on which feedback is now being sought:

- a **strategic** section, which documents hazards and risks, sets out the region's goals for emergency management, identifies issues and options for addressing these, and sets priorities for the next five years.
- an **operational** section, which identifies roles and responsibilities between different agencies to ensure we are prepared to effectively respond and recover from a major emergency.
- an **administrative** section, which outlines funding arrangements and how the Group will function on a day to day basis.
- a **plan monitoring and review** section, which will describe how the Plan will be monitored and reviewed over its five year term.

The focus for the next six months is to get feedback from all those involved in civil defence and emergency management in order to close existing gaps and to ensure the Plan is as comprehensive as possible.

Once consultation with key partner organi-

sations has been completed, consultation with targeted key groups such as lifeline utilities, Iwi and strategic stakeholders (e.g. government agencies and volunteer community groups) will begin, most likely in November of this year.

Once the CDEM Group formally approves the working draft Plan, it will be publicly notified and submissions will be called for. The public will be invited to a series of meetings to hear and talk about the Plan in early to mid 2004.

Civil Defence Emergency Management training courses:

The CDEM Group is also working with training providers to develop a range of workshops on the new direction in civil defence emergency management.

For the most up to date version of the working draft Plan and more information about the CDEM Group please see the CDEM Group website: www.auckland.cdemg.org.nz; or contact by email: info@cdemg.org.nz Alternatively, please contact David Allen, Civil Defence Emergency Management Office by telephone: (09) 366 2000 x8043.

Hazardous Times Resource List Reports

COASTAL HAZARDS <input type="checkbox"/> Auckland Regional Council. Coastal Hazard Strategy and Coastal Erosion Management Manual. Auckland Regional Council Technical Publication No.130, July 2000. (\$129.00 Hardcover/\$49.00 CD Rom)	INFRASTRUCTURE FAILURE/AUCKLAND ENGINEERING LIFELINES GROUP PUBLICATIONS <input type="checkbox"/> Auckland Regional Council. Auckland Engineering Lifelines Group-Lifelines Co-ordination (Response) Project AELG-2. Auckland Regional Council Technical Publication No.173, May 2002. (Free).
EARTHQUAKE <input type="checkbox"/> Alloway, B., Lyall, J. & Kozuch, M. Mapping and Characterisation of the Drury Fault. Auckland Regional Council Technical Publication No.96, September 1998. (includes A1 map of fault geology) (\$25.00)	<input type="checkbox"/> Auckland Regional Council. Auckland Engineering Lifelines Group Priority Emergency Routes Auckland Region. Auckland Regional Council Technical Publication No.145, November 2001. (\$25.00)
<input type="checkbox"/> Stephenson, W., Baguley, D. & Kozuch, M. Assessment for Amplification of Earthquake Shaking by Soft Soils in Central Auckland. Auckland Regional Council Technical Publication No.94, July 1998. (includes A1 map of site locations) (\$25.00)	<input type="checkbox"/> Auckland Regional Council. Auckland Engineering Lifelines Group Volcanic Ash Review, Part 1: Impact on lifeline services and collection and disposal issues. Auckland Regional Council Technical Publication No.144, May 2001. (\$25.00)
<input type="checkbox"/> Stephenson, W., Townsend, T. & Hull, A. Assessment for Amplification of Earthquake Shaking by Soft Soils in South Auckland. Auckland Regional Council Technical Publication No.87, August 1997. (Free)	<input type="checkbox"/> Auckland Regional Council. Auckland Engineering Lifelines Project, Final Report - Stage 1. Auckland Regional Council Technical Publication No.112, November 1999. (Includes CD-ROM) (\$100.00)
<input type="checkbox"/> Fellows, D.L. Preliminary Paleoseismic Assessment of the Wairoa North Fault. Auckland Regional Council Technical Publication No.75, September 1996. (includes A1 map of fault 1:25,000) (\$40.00)	<input type="checkbox"/> Auckland Regional Council. Part 3: Risk Management: Looking Forward from the Auckland Power Crisis. Auckland Regional Council Technical Publication No.100, January 1999. (\$25.00)
<input type="checkbox"/> Hull, A.G., Mansergh, G.D., Townsend, T.D. & Stagpoole, V. Earthquake Hazards in the Auckland Region. Auckland Regional Council Technical Publication No.57, April 1995. (includes two A3 maps: fault hazard and preliminary ground shaking hazard) (\$25.00)	<input type="checkbox"/> Auckland Regional Council. Auckland Engineering Lifelines Project, Stage 1 Report. Auckland Regional Council, Technical Publication No.116, July 1997. (\$90.00 Hazard and Network information-project participants only) (\$80.00 Hazard information only-non-project participants)
EDUCATION <input type="checkbox"/> Ronan, K.R. & Johnston, D.M. Children's Risk Perceptions and Preparedness: A Hazards Education Survey. Auckland City Council and Auckland Regional Council, Auckland, March 1997. (Available on loan from ACC Library)	AUCKLAND CDEM GROUP PUBLICATIONS <input type="checkbox"/> Auckland Region Civil Defence Emergency Management Group. Extent of Civil Defence Emergency Management Planning in the Auckland Region. Auckland Regional Council Technical Publication No.180, July 2002. (\$25.00)
FLOODING <input type="checkbox"/> Auckland Regional Council. Dam Safety and Surveillance Guidelines for Safe Practice. Auckland Regional Council Technical Publication No.109, June 2000. (\$30.00)	<input type="checkbox"/> Auckland Region Civil Defence Emergency Management Group. Management Mechanisms used by Emergency Management Agencies for Natural and Technological Hazards in the Auckland Region. Auckland Regional Council Technical Publication No.181, May 2002. (Free)
<input type="checkbox"/> Auckland Regional Council. Low Impact Design Manual for the Auckland Region. Auckland Regional Council Technical Publication No.124, April 2000. (\$20.00)	RISK MANAGEMENT <input type="checkbox"/> Local Authority Hazard Liaison Group. Hazard Guidelines. Auckland Regional Council Technical Publication No.106, July 2003. (\$75.00)
<input type="checkbox"/> Auckland Regional Council. Guidelines for Stormwater Modelling in the Auckland Region. Auckland Regional Council Technical Publication No.108, April 1999. (\$25.00)	<input type="checkbox"/> Auckland Regional Council. Civil Defence Disabilities Planning Guide. Auckland Regional Council Technical Publication No.98, September 1998. (Free)
LAND INSTABILITY <input type="checkbox"/> Williams, A. Slope Instability Hazards in the Auckland Region: A Preliminary Assessment. Auckland Regional Council Technical Publication No.71, June 1996. (includes four A3 maps 1:500,000: soil/rock mass distribution, slope grade distribution, areas of slope instability, instability hazard) (\$35.00)	<input type="checkbox"/> Daly, M. & Hull, A. Natural Hazards Management Workshop 95: Workshop Summaries. Auckland Regional Council, Technical Publication No.70, May 1996. (Workshop Proceedings are available from the Institute of Geological & Nuclear Sciences, PO Box 30-368, Lower Hutt) (Free)
METEOROLOGICAL EXTREMES <input type="checkbox"/> Salinger, M.J., Porteous, A.S., Reid, S., Thompson, C. & Snelder, T. Meteorological Hazards in the Auckland Region: A Preliminary Assessment. Auckland Regional Council Technical Publication No.76, November 1996. (Free)	HAZARD FACTS Auckland Regional Council's Hazard Facts are a series of free factsheets written to provide the public with hazard information.
<input type="checkbox"/> Hessel, J.W.D. Hazards in the Auckland Region due to Meteorological Extremes: An Initial Assessment. Auckland Regional Council Working Report No.68, January 1996. (Free)	H01 Auckland's Volcanic Field H02 How Do Auckland's Volcanoes Form? H03 Rangitoto: Auckland's Youngest Volcano H04 Auckland's Volcanic Hazards H05 Auckland Volcano Seismic Monitoring Network H06 Measuring Earthquakes H07 Earthquakes in Auckland H08 Earthquake Hazards H09 What is a Tsunami? H10 Volcanic Eruptions in Auckland – How to Survive H11 Hazards in Auckland
TSUNAMI <input type="checkbox"/> de Lange, W.P. & Hull, A. G. Tsunami Hazard for the Auckland Region. Auckland Regional Council Technical Publication No.50, November 1994. (Free)	Hazard Facts are available from ARC: 366 2000 or 0800 80 60 40 or online at: www.arc.govt.nz
VOLCANIC <input type="checkbox"/> Auckland Regional Council. Contingency Plan for the Auckland Volcanic Field. Auckland Regional Council Technical Publication No.165, January 2002. (\$45.00)	
<input type="checkbox"/> Paton, D. Auckland Volcanic Risk Project - Stage 2. Auckland Regional Council Technical Publication No.126, November 1999. (\$25.00)	
<input type="checkbox"/> Johnston, D.M., Nairn, I.A., Thordarson, T. & Daly, M. Volcanic Impact Assessment for the Auckland Volcanic Field. Auckland Regional Council Technical Publication No.79, April 1997. (\$35.00)	

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