

CONTENTS

VISG Co-ordinator's Note	1	Global Eruption Roundup	3
News	1	Media Coverage	3
Research Spotlight	1	Upcoming Events	3
Research Highlights	2	Contact	3

VISG CO-ORDINATOR'S NOTE

by Natalia Deligne

Health and safety is key for all of us. While volcanic eruptions are (fortunately!) rare events, they present unique and at times dramatic health and safety challenges. I hope you will be able to join us at this year's annual VISG seminar, which will focus on various health and safety considerations for volcanic crises. The seminar will be in Wellington on 4 November, the day after the National Lifeline Forum – see the Upcoming Events section for more information.

This quarter's Research Spotlight previews volcanic ashfall guidelines being developed by the Volcanic Health Impacts Subgroup of the New Zealand Volcanic Science Advisory Panel. These guidelines are aimed towards the general public and will complement the VISG ash impact poster series. We will provide a link to these guidelines when they are finalised in a future VISG newsletter.

NEWS

The **VISG ash impact poster series** were recently used in **Cabo Verde** during the crisis on Brava volcano (see the Global Eruption Roundup). The ash impact posters have now been used in New Zealand, South America, and Africa.

The **Determining Volcanic Risk in Auckland (DEVORA)** programme now has a **wiki** for use (www.devora.org.nz/wiki). The major function of this wiki is to provide an open-access forum for discussion between researchers. Accounts have been created for everyone on the DEVORA email list. If you are not on the email list or have not received your account information and would like an account, you can request access from Tracy Howe (t.howe@auckland.ac.nz).



RESEARCH SPOTLIGHT

New volcanic ashfall advice for the public

by Carol Stewart, Joint Centre for Disaster Research, Massey University / GNS Science

Three new volcanic ash-related guidelines for the public are being prepared by the Volcanic Health Impacts Subgroup of NZVSAP (NZ Volcanic Science Advisory Panel) and should be available by the end of the year. These guidelines cover: 1) Volcanic ash respiratory protection advice in volcanic ashfall; 2) Volcanic ash clean-up advice for households; and 3) Protecting home and farm water supplies.

These guidelines are being developed because we recognised that in these three areas existing advice from different New Zealand government agencies was, to varying extents, inconsistent, incomplete, out of date and/or not specific to New Zealand. We are using the following process to develop the guidelines: we first collated and reviewed existing resources; we next drafted new guidelines building on the depth of experience available from VISG researchers; and finally we submitted the draft guidelines to a wide range of agencies for review. As of end of August, the review process is well underway for the first two guidelines (respiratory protection

and household clean-up), and the third guideline (home and farm water supplies) is in preparation.

For the 'Volcanic ash respiratory protection advice' guidelines, we draw on research undertaken over the past 20 years in New Zealand and internationally. The primary strategy recommended to protect public health is avoidance; this is particularly important for high-risk groups such as children, older adults and those suffering from pre-existing respiratory conditions such as asthma. For people who cannot avoid exposure to airborne ash, such as people involved in clean-up operations, we make recommendations about the use of dust masks and other protective equipment. However, we caution that masks can restrict breathing which can impose stresses on people. Reviewers of this guideline have included a public health unit; members of the Asthma Research group at University of Otago; the International Volcanic Health Hazards Network; and communications specialists at the Ministry of Civil Defence and Emergency Management.

The new guidelines on 'Volcanic ash clean-up advice for households' is intended to be a complementary resource to the existing VISG poster on 'Advice for urban clean-up operations'; the latter is aimed at coordinating organisations such as local councils. The new guideline has a strong emphasis on health and safety precautions, particularly for roof clean-up. Research from volcanic impact assessment trips has highlighted the prevalence of injury from people falling off roofs while cleaning properties. The guideline also describes preventative measures to protect property from ashfall and minimise ash ingress into homes and emphasises the importance of coordination with neighbourhood and community level clean-up efforts (see the photo for

an example from Japan). Reviewers have included representatives from the Central Plateau Volcanic Advisory Group (including regional civil defence advisors and a public health unit); communications specialists at the Earthquake Commission; and staff of GeoNet.

The third set of guidelines on 'Protecting home and farm water supplies' will draw on research by VISG scientists both in New Zealand and overseas.

When the guidelines are finalised, we will provide a link to them in the VISG newsletter in 'News'. They will also be discussed at the annual VISG Seminar on 4 November (see 'Upcoming Events').



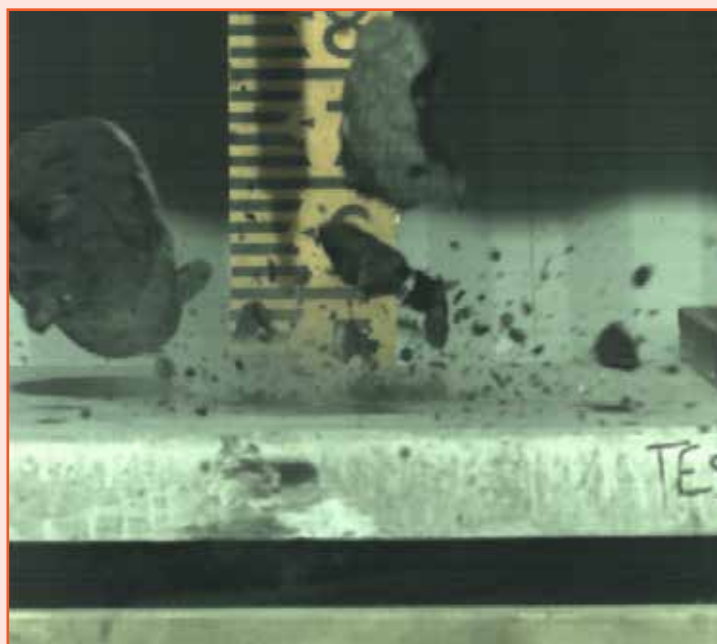
Roadside ash collection point in the city of Kagoshima, Japan (photo: Daniel Blake, University of Canterbury)

RESEARCH HIGHLIGHTS

A **new pneumatic cannon** is firing up at the **University of Canterbury** to investigate life safety and building **vulnerability to ballistic impacts**. The new cannon is capable of shooting 5 kilogram rocks at over 100 metres per second, allowing for accurate simulations of ballistic impacts

from a wider range of eruption styles. Current testing carried out by UC's George Williams is investigating the **damage caused by ballistics** of varying strengths and porosities to reinforced concrete buildings. Experiments such as these inform appropriate life safety actions and provide data to improve ballistic

vulnerability assessment and bring it in line with more sophisticated hazard models. Testing is being carried out in collaboration with two of UC's Civil Engineering students, Callum Boot and George Daly, and is funded by EQC, DEVORA and the Natural Hazards Research Platform.



144 km/h impact to a reinforced concrete roof slab built to NZS: 3101, captured using 1000 frames per second camera footage. Ballistic shrapnel is ejected from the frontface of the slab whilst concrete fragments have been shattered off the backface, implying significant hazard both inside and outside concrete structures during eruptions. Photo credit: George Daly



Impacts to reinforced concrete slabs. Left photo illustrating a full perforation with ~4 kg of concrete fragments ejected from the backface. Right illustrating the shear cone on the backface of a 1m by 1m slab post-impact. Photo credit: George Daly

GLOBAL ERUPTION ROUNDUP

By Josh Hayes

A wide range of impacts have been seen from volcanic eruptions over the last few months including urban clean-up operations, flight cancellations, and impacts to agriculture.

Popocatepetl – Mexico

Areas of Mexico City required clean-up following an eruption of Popocatepetl Volcano in late July 2016. Official advice from civil protection authorities was for people to remove ash from roofs and streets, and put the ash into rubbish bags to keep it from clogging drainage systems.

Island of Brava– Cape Verde

Seismic activity in early August on the Island of Brava led to around 300 people being evacuated from Cova Da Joana town for fears of a volcanic eruption. It is unclear how long residents were evacuated for. It was reported that earthquakes were felt by residents on the island during 3-4 August. Monitoring of carbon dioxide emission found nothing unusual between 4-7 August.

Mount Rinjani– West Nusa Tenggara, Indonesia

Mt. Rinjani caused a number of flight delays and cancellations. Flights between Bali and Lombok were cancelled, and five international flights from Australia to Bali were also cancelled. In total around 30 flights were cancelled due to closure of Lombok airport.

Mount Sinabung – Sumatra, Indonesia

Mt. Sinabung continues to erupt causing 5,535 residents from eight different villages to evacuate from Tanah Karo district of North Sumatra. In recent months the eruption of Sinabung has had considerable impact on the areas agricultural industry. Lettuce, tomato, chilli peppers, cabbage, potatoes, and oranges were said to be hardest hit by the eruption. Chilli and cabbage farmer's losses could amount to 21 billion Rp each and tomato farmers around 18 billion Rp. Potato production throughout the area was said to be at about 50 percent, whilst chili production was at 30 percent.

MEDIA COVERAGE

The **New Zealand Herald** covered an ongoing project estimating **magma ascent rates in the Auckland Volcanic Field**, co-lead by Marco Brenna and Elaine Smid from University of Auckland (http://m.nzherald.co.nz/nz/news/article.cfm?c_id=1&objectid=11666183). This information may help lifelines understand how long they will have to prepare for an eruption after initial signs of volcanic unrest. The project is funded by the EQC's Biennial Grants Programme.

VISG coordinator **Natalia Deligne** was profiled the Career Market section of the **Dominion Post** on 20 July 2016.



Eruption at Mt Sinabung, Sumatra, Indonesia. Photo: topsy.fr

UPCOMING EVENTS

DEVORA is participating in the **Auckland Heritage Festival** with a booth at the **University of Auckland Commerce A Building 114 (3A Symonds Street)** on **8 October 2016** from 10 am – 2 pm. This is a family-friendly event; all ages are welcome. For more information contact Elaine Smid (e.smid@auckland.ac.nz).

The annual **Volcano Short Course**, organised by GNS Science, will be held in **Rotorua** on **12-13 October 2016** with an optional field trip on 14 October. For more information contact Daryl Barton (d.barton@gns.cri.nz) or visit <http://gns.cri.nz/Home/News-and-Events/Events/Volcano-Short-Course2>.

The annual **Volcanic Impact Study Group (VISG) seminar** will be held in **Wellington** on **4 November 2016** from 10 am – noon at the Wellington Regional Emergency Management Office (WREMO) on 2 Turnbull Street. This year's theme will be health and safety during and following volcanic crises. The event is free, but for catering purposes please RSVP to Natalia Deligne (N.Deligne@gns.cri.nz) by 28 October.

The **annual DEVORA forum** will be held at the **University of Auckland** on **10 November 2016**. The event is free, but for catering purposes please RSVP to Elaine Smid (e.smid@auckland.ac.nz) by 3 November.

CONTACT

Dr. Natalia Irma Deligne

Volcanic Hazard and Risk Modeller
GNS Science - Te Pu Ao
PO Box 30368
Lower Hutt 5040
New Zealand

Email: N.Deligne@gns.cri.nz
Tel: +64 4 570 4129
Fax: +64 4 570 4600



2016 ANNUAL VISG SEMINAR

HEALTH & SAFETY DURING VOLCANIC CRISES

FRIDAY 4 NOVEMBER

10am – NOON

WELLINGTON REGION EMERGENCY MANAGEMENT OFFICE

2 Turnbull Street, Thorndon, Wellington

Volcanic crises come in many guises, ranging from short to prolonged, and from severe (typically close to the volcano) to nuisance (typically further away). The 2016 annual VISG seminar will examine current practices and recent research advances in managing health and safety considerations during volcanic events.

The seminar will feature:

- A preview of New Zealand Volcanic Science Advisory Panel Volcanic Health Impact Subgroup guidelines concerning volcanic ash respiratory protection, household volcanic ash clean-up, and protecting home and farm water supplies.
- Overview of the leading causes of fatalities resulting from volcanic eruptions.
- Insights from the Department of Conservation on ensuring staff and visitor life-safety during volcanic crises.
- Latest research implications on how driving conditions are altered during and after volcanic eruptions.
- Refresher on GeoNet products available during volcanic crises.

All are welcome, particularly those from lifeline sectors, government agencies, risk managers, health and safety practitioners, and the research community.

THE EVENT IS FREE.

RSVP to Natalia Deligne (N.Deligne@gns.cri.nz), preferably by **28 October 2016**.

