DETERMINING VOLCANIC RISK IN AUCKLAND

Auckland is a vital link in New Zealand's economy and the city and surrounding region are internationally desirable places to work. However, Auckland sits on a volcanic field. The DEVORA research programme is aimed at a much-improved assessment of volcanic hazard and risk in the Auckland metropolitan area.

Media Watch on the Auckland Volcanic Field

Click on a range of links to view media stories and risk-related news coverage relevant to the Auckland Volcanic Field.

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2019

Volcanic threat in Auckland (December 2019)
Following the devastating Whakaari (White Island) eruption in December, there was more interest in understanding the volcanic threat around the rest of New Zealand – including Auckland. Information about the Auckland Volcanic Field (and the rest of New Zealand) can be found in the articles below, including activity levels, and what threats volcanoes pose to our communities:

- 'Beautiful but deadly': NZ's ever-present volcanic risk
- White Island eruption: Just how active are New Zealand's volcanoes?

When Aotearoa heats up from below (December 2019)
DEVORA researcher Assoc Prof Tom Wilson was interviewed by Radio New Zealand and chats about the risks of New Zealand volcanism in The Detail, below:

- When Aotearoa heats up from below (*Tom Wilson interview, Radio New Zealand's The Detail, 9/12/2019)*

Auckland volcanoes: 6km blast, ash hurricane and as little as a day's eruption warning (December 2019)
Professor James White compares the Auckland Volcanic Field to volcanic fields in California and Arizona. These analogues are used to discuss what we can expect in the event of an eruption in Auckland and how much warning we would have beforehand.

- Auckland volcanoes: 6km blast, ash hurricane and as little as a day's eruption warning (*Professor James White interview, Stuff, 29/12/2019)*

New book highlights Auckland's volcanic cones (November 2019)
Bruce Hayward has recently released his new book "Volcanoes of Auckland: A Field Guide". He is interviewed by Francesca Rudkin on Newstalkzb where they discuss the Auckland Volcanic Field, and the threat it poses to Auckland City.

- New book highlights Auckland's volcanic cones

'Beneath New Zealand' Airs (June 2019)
Prime TV airs the 'Beneath NZ' episodes starting Sunday, 9 June at 8:30 pm. The series focuses on NZ's volcanism, past, present, and future.

The third episode focuses on Auckland and features quite a few DEVORA researchers and findings:

- https://www.primetv.co.nz/-/prime_beneathnz_ep3
- New show about New Zealand's volcanoes (*Jan Lindsay interview, Radio New Zealand's Afternoons with Jesse Mulligan, 7/6/2019)*
- Aucklanders should get ready for an eruption

Volcanic Fingerprints (Jan 2019)

Volcanic ash has a chemical signature that is unique to its source. DEVORA researcher Dr Jenni Hopkins is using this trait to reconstruct the eruption history of the Auckland Volcanic Field.

- Volcanic Fingerprints (*Victoria University of Wellington, News webpage, 30/1/2019*)

The worst natural disaster risks facing New Zealand (Jan 2019)

DEVORA and many of our talented researchers feature in this magazine article describing, amongst other NZ hazards, an Auckland eruption.

- The worst natural disaster risks facing New Zealand (*North & South Magazine, 15/1/2019*)

Errors in Newshub graphic (Jan 2019)

Newshub created a 3D graphic depicting the Auckland Volcanic Field. This graphic contains several significant errors, including:

–the population of Auckland is not ~4.7 million. According to Statistics NZ, it is ~1.6 million

–we do not think that the Auckland Domain is the oldest volcano; Pupuke is probably the oldest at approximately 190,000 years old

–the eruption order was created by Dr Jenni Hopkins for her PhD research (see here: https://www.facebook.com/DEVORAProject/videos/837561346431039)

- Newshub graphic reveals Auckland's deadly volcanic field (Newshub, *14/1/2019*)

(Note: this article has since been removed)

2018

Christchurch lava lab could help prepare for Auckland eruption (Dec 2018)
Researchers at Canterbury University are creating their own lava flows for experiments. The results have implications for Auckland in future eruptions.

- Christchurch lava lab could help prepare for Auckland eruption (*Stuff, 20/12/2018*)

Auckland Ascent Rates – How Much Warning Time Will We Have? (July 2018)
Dr. Marco Brenna, a researcher with Otago University, recently published a paper on how diffusion in olivine crystals suggests that magma ascent in the Auckland Volcanic Field may happen quite rapidly. While we knew from geochemical evidence, models, and related studies of other volcanic areas that magma ascent was likely to be fast (days to weeks) in Auckland, this study is the first to use Auckland samples to estimate how quickly magma rises from the mantle to the surface. The article received some press:

- Auckland could get just five days' warning of eruption (*NZ Herald, 27/8/2018*)
- Auckland could have just five days' warning before a volcanic eruption (*Stuff, 27/7/2018*)

Deadly Base Surge Research Commences (July 2018)
Dr Stuart Mead (Massey) is researching the deadliest threat associated with Auckland eruptions: volcanic base surges, and this caused a media stir. Surges are destructive clouds of hot gas and ash that form when water and magma mix. We see evidence of surges at ~80% of Auckland volcanoes. Stuart's research is supported by the Earthquake Commission in a separate but affiliated project. The EQC is a great supporter of DEVORA and a lot of other research projects focused on understanding the threats posed by the Auckland Volcanic Field. We look forward to hearing about Stuart's findings!

- Earthquake Commission funds new research to better understand Auckland's volcanic surges (*Stuff, 24/07/18*)
- Study into Auckland eruption reveals impact to city (*NZ Herald, 24/07/18)*
- EQC funds research on Auckland volcanic surges (*Scoop, 24/07/18)*
- The biggest risk to life if Auckland erupts (*Southgate Observer, 19/8/2018*)

Press Release: The current eruption of Kilauea: Could it happen in Auckland? (May 2018)
The current eruption of Kīlauea volcano on Hawai'i has provided some spectacular footage of cracks opening in roads, fountains of glowing lava, and billowing clouds of gas – and has people wondering whether such activity could occur in Auckland. We thought this would be

a great opportunity to explain how this latest eruption on Hawai'i compares with what we might expect in Auckland if our volcanic field reactivates.

View Press Release

Related Press Articles and TV Coverage:

- Why Hawaii's eruption matters for volcanic Auckland (*NZHerald, 9/5/2018*)
- Hawaii eruption an 'eerie analogue' for Auckland volcano risk, scientists say (*Stuff, 8/5/2018*)
- NZ scientists keeping close watch on Hawaii's volcanic eruption (*NewsHub, 7/5/2018*)
- Could a volcanic eruption like Kilauea happen in Auckland? (RadioNZ, 11/5/2018)
- Auckland volcanic eruption could look similar to Hawaii's Mt Kilauea, scientists say (TVNZ, 12/5/2018)

2017

Simulating a Possible Eruption in Auckland (September 2017)

This week, University of Auckland students participated in a simulation of an Auckland Volcanic Field eruption. After a day in the field, they took on the challenge of guiding the city through several months of preparation and the eruption itself. Learn more by listening to Prof Kathy Campbell's interview with Radio New Zealand here.

Will your roof withstand flying volcanic rocks?(July 2017)

UC researchers are exploring the consequences of flying volcanic rocks ("ballistics") on building materials. This is truly "groundbreaking" research that garnered both TV and radio coverage in June/July. Check out the links below to find out more:

- Will your roof withstand flying volcanic rocks?(*Radio NZ, 15/6/2017*)
- How safe is your house if a volcano erupts nearby? (*TVNZ 30/7/2017*)

AVF Eruption History Decoded (July 2017)

Fourty-eight of Auckland's 53 volcanic centres can now be placed in order. To do this, researchers devised new and improved techniques to figure out the eruptive history of the Auckland Volcanic Field, with some surprising findings. Their findings were summarized in two papers, which both garnered media attention. The two articles can be found here and here. To read the press articles or listen to the radio interview see the links below:

- Scientists reveal Auckland's explosive history (*NZ Herald 18/7/2017*)
- Decoding Auckland's Volcanic Past (*Radio NZ 18/7/2017*)
- Auckland's volcanic eruptions surprisingly recent, study reveals (*Newshub 18/7/2017*)

- Auckland volcanoes temperamental, unpredictable: studies (*XinhuaNet 18/7/2017*)
- Rate of Auckland volcanic eruptions increasing, scientists say (*Stuff 18/7/2017*)
- Science Deadline: Auckland's unpredictable volcanoes (*Business Scoop 21/7/2017*)
- Studies reveal Auckland Volcanic Field's past (*Radio Live 23/7/2017*)

DEVORA Publication is Most Downloaded JVGR Article in 2016 (May 2017)

"Volcanic Hazard Impacts to Critical Infrastructure: A Review", a DEVORA article by Grant Wilson, has been named as JVGR's most downloaded article for 2016. It's been downloaded ~10,500 since it's publication in 2014. That's quite an achievement and we're really excited for Grant and the Canterbury team! For more information, click here.

Shortland Street's Explosive 25th Anniversary Episode (May 2017)

For the 25th anniversary episode of Shortland Street, the cast of characters had to contend with a volcanic eruption. GNS science was consulted to ensure that the scenario was as realistic as possible. For more information on how the TV show handled the volcanology, check out the Stuff article here.

DEVORA Featured on The Panel with Jim Mora (May 2017)

On May 26th, The Panel with Jim Mora did a short segment on whether or not there will always be warning prior to an AVF eruption. Natalia Deligne explained that GNS monitors the Auckland Volcanic Field through Geonet and that we can expect anywhere from a few hours to few weeks of detectable unrest. See the link below to check out the segment:

- Volcanic hazard and risk for Auckland unknown (*RadioNZ 26/5/2017*)

The Impacts of an AVF Eruption (April 2017)

Daniel Blake's recent paper on the impact of an AVF eruption to the Auckland transport network has caused quite a stir. The paper, titled "Investigating the consequences of urban volcanism using a scenario approach II: Insights into transportation network damage and functionality", is the second part of the AVF Scenario Series and follow's Natalia Deligne's earlier paper. To read some of the recent news articles about the work, check out the links below:

- Auckland eruption scenario: 435,000 displaced (*NZ Herald 11/4/2017*)
- Volcanic eruption could cripple Auckland's transport network: scientists (*Stuff 11/4/2017*)

DEVORA Outreach in the News! (March 2017)

On April 2, the DEVORA outreach team participated in the MOTAT Science Street fair. Click here to read the MOTAT Press Release about the event.

Investigating the Consequences of an AVF Eruption Using Scenarios (March 2017)

Natalia Deligne's paper "Investigating the consequences of urban volcanism using a scenario approach I: Development and application of a hypothetical eruption in the Auckland Volcanic Field, New Zealand" was just published in the *Journal of Volcanology and Geothermal Research*. The paper details what might happen in Auckland if the city was impacted by a volcanic eruption in the Mangere Bridge area. Specifically, it focuses on the potential impacts and outcomes of such activity on eletricity service provision throughout the region. As expected, the paper generated a lot of media interest. Check out the links below to read some of the recent articles or listen to the radio interviews:

- Auckland's next big eruption likely to come from a volcano that doesn't yet exist, scientists say (*Stuff 3/3/2017*)
- Scientists plot the destruction that a volcanic eruption in Auckland could cause (*NZ Herald 5/3/2017*)
- Volcanic eruption: How would Auckland cope if one blew? (*NewsHub 5/3/2017*)
- What would happen if an Auckland volcano erupted? (*RadioNZ & MSN 6/3/2017*)
- Scientists investigate Auckland eruption scenarios (*RadioNZ Interview 6/3/2017*)
- A Volcano Erupts In Auckland.... In Theory (*Forbes Online 6/3/2017*)
- Cartoons: AVF Scenario (*NZ Herald Cartoons 7/3/2017*)
- Impact of a Volcanic Eruption on Auckland with Natalia Deligne (*WTV Interview 7/3/2017*)
- Impact of an Eruption in Auckland (*Seven Days Segment [@21 min] 10/3/2017*)

Cities on Volcano 9: Let's Talk with Scientists! (February 2017)

In November 2016, several DEVORA volcanologists attended Cities on Volcanoes, an annual conference focused on the impact of volcanic activity on urban environments around the globe. Emma Hunt from Auckland CDEM also attended the conference, which focused heavily on communicating science to practitioners and communities. To learn more, please read the CDEM E-bulletin here.

2016

How Auckland volcanoes Could Erupt (December 2016)

Based on Gabor Kerestzuri's recent work, journalists from the NZ Herald have created an interactive map which highlights the linkages between Auckland's subsurface geology and

the type of expected future eruption in any given area of the city. Herald Insights is a new interactive, data driven forum where "stories are told through text, interactive graphics and maps". This is the first DEVORA work to be presented as an 'Insight'. Click on the link below to read the article and see the map:

- How Auckland Volcanoes Could Erupt (*Herald Insights 2/12/16*)

Probing the History of New Zealand's Orakei Maar (September 2016)

Over 2 weeks in February 2016, DEVORA team members and their collaborators drilled two ~100 m-long cores into the sediments at the bottom of Auckland's Orakei Basin, a volcanic explosion crater-turned-lake basin. We were able to recover the collected lake bed sediments all the way down to the original volcanic deposits from Orakei Basin's eruption. Here is a great article describing a little more about what we are doing with the cores, and why we wanted to drill:

- Probing the history of New Zealand's Orakei Maar (*Eos,* 97, 20/09/2016)

Developing volcanic hazard and risk models for the AVF (July 2016)

Natalia Deligne has finished her post-doc looking at the short term impacts of a volcanic eruption occurring within Auckland. Her work shows the importance of the RiskScape tool and of creating detailed scenarios.

- Developing Volcanic Hazard and Risk Model for AVF (*Rebuild Christchurch,* 30/06/2016*)*

Rangitoto: Not What We Expected (March 2016)

The results of the Rangitoto Drilling Project indicate the history of the volcano may be far more complex than scientists originally thought. New ages obtained from the 150m core suggest that the island may be ~6000 years old rather than just 500. Phil Shane, the project leader, suspects that Rangitoto may actually be a cluster of several smaller volcanoes rather than one larger edifice.

- Volcano Hiding Explosive Secret (*NZ Herald*, 28/03/2016)

Auckland one of the best prepared English-speaking cities in the world

Dr Allan Bonner, expert in Crisis Management, ranked Auckland the best prepared English-speaking city in the world, based on the Auckland Emergency Management's *Emergency Management Group Plan 2010 – 2015.* This ranking made the news and is

included in Dr Bonner's book, *Safer Cities of the Future.* Dr Bonner cited AEM's recognition of volcanic risk as one of the reasons for the ranking.

- Auckland world's best in preparing for disaster, says report (*Stuff*, 02/02/2016)
- Auckland considered world leader for emergency plan (*NewsTalk ZB,* 02/02/2016)
- Auckland's Civil Defence plan attracts global kudos (*Auckland Council website,* 11/02/2016)

Orakei Drilling Project: Delving Deep into History (February 2016)

As part of grant to reconstruct Auckland's climate history, scientists from the University of Auckland, Victoria University, and GNS drilled >100 m into the center of Orakei Basin. Samples retrieved from the drilling not only provide a detailed record of climate fluctuations but also of the volcanic history of the region. The core, which potentially spans >140,000 years, will help map out in unprecedented detail past AVF eruptions.

- Delving Deep into History (*NZ Herald*, 18/02/2016).
- Geologist hunt for clues about Auckland Volcanic activity (Geonet, 18/02/2016).

What happens if Auckland's volcanoes erupt? (January 2016)

Dr Jenni Hopkins was interviewed about her latest research by Radio New Zealand. In the interview, she discusses how researchers study AVF volcanoes and gives an overview of the upcoming Orakei drilling project. Click here to listen to the interview.

2015

Predicting the Impact of an Auckland Eruption (December 2015)

Recent DEVORA PhD graduate, Dr Jenni Hopkins, has had her research findings profiled in several news articles. Her PhD focused on correlating ash found in lake cores around Auckland to source volcanoes to better understand the order of eruptions in Auckland, and the impact that they had (e.g. how far ash/deposits from each volcano traveled, and their thicknesses). Her research is instrumental in creating an age order for the volcanoes to better understand the evolution of the field, and to figure out how ash and other volcanic deposits may affect Auckland during future eruptions (for example, how far did ash/deposits travel from each volcano? How thick are they 'x' kilometers away from the vent?).

- Predicting the Impact of an Auckland Eruption (*VUW*, 14/12/2015, *original press release)

- A Better Understanding of Auckland Volcanoes (*Sciblogs News*, 14/12/2015)
- Predicting the Impact of an Auckland Eruption (*Voxy*, 14/12/2015)
- Predicting the Impact of an Auckland Eruption (*Wellington Scoop*, 14/12/2015)
- Volcanic eruptions in Auckland: What's the Risk? (*New Zealand Herald*, 15/12/2015) (One note: Though we could experience an eruption in Auckland at any time, none of our research findings imply that it will definitely happen within the next few hundred years, as the article suggests. We have no way of knowing that–we can only just learn as much about the volcanic field as we can, and be prepared!)

Economic Impacts of an Auckland Eruption Studied (May 2015)

DEVORA/IIOF researchers Shane Cronin and Garry McDonald's economic modelling indicate that the disturbance an eruption would cause in certain areas of Auckland would lead to a greater impact on the economy than in other locations. See the NZ Herald article here:

- Huge Blow if Eruption Hit Factory Zones (*NZ Herald*, 11/05/2015)

What Areas of Auckland are Susceptible to Explosive Eruptive Activity? (May 2015)

New research by former DEVORA/IIOF PhD Gabor Kereszturi highlights a method that can be used to create an 'explosive eruption susceptibility' map for Auckland. The preliminary map, used as an example of what the conceptual model can show, identifies zones that are more likely to produce explosive style eruption behaviours (such as base surges) IF an eruption were to occur in these areas. Highly susceptible zones are not more likely to be the location of future eruptions necessarily, and a lot of data still needs to be added to the model to refine these results. The original article can be read in full here.

Read about the research as covered by the press here:

- Scientists Map auckland's Volcanic Hazard Zones (*Massey News*, 07/05/2015)
- Next Auckland Eruption: Should You Worry? Map Pins Volcano Risk Spots (*New Zealand Herald*, 07/05/2015)
- New Study Reveals Auckland's Volcanic Risk (*Stuff*, 07/05/2015)

Hear About 'Auckland's Volcanic Risk' (April 2015)

Listen to volcanologist Jan Lindsay describe the base surge deposits and eruption at Glover Park, what we know about how Auckland's volcanoes behave, and what we'd expect from the next Auckland eruption on Radio New Zealand National's 'Our Changing World' programme:

- Auckland's Volcanic Risk (*Radio New Zealand National*, 16/04/2015)

Red for Danger (April 2015)
This article describes Mary Anne Thompson's work on how hazard map design choices influence the communication of hazard.

- Red For Danger (*GeoScientist Online*, v. 25 (3), April 2015)

The Fire Beneath Us (January 2015)
This in-depth article, two years in the making, describes and illustrates the Auckland Volcanic Field and the DEVORA research programme like never before.

- The Fire Beneath Us (*New Zealand Geographic*, Jan-Feb 2015, issue 131)

Preparing for the volcano in your backyard: New Zealand sets an example (December 2014)
DEVORA researcher Natalia Deligne was invited to write an opinion piece for *EARTH Magazine*. The piece provides a fantastic overview of the DEVORA and RiskScape research programmes, ongoing as we 'wait for the inevitable: a local volcanic eruption.'

- Preparing for the volcano in your backyard (*EARTH Magazine*, Dec 2014)

2014

Auckland Eruption Exercise Makes Headlines (September 2014)
A story and photos of the annual eruption exercise was chosen for the cover story of *CDEM Impact*, a quarterly magazine for NZ's civil defence sector.

- **Auckland students practise for the 'Big One'** (*CDEM Impact*, v. 53, September 2014)

Profiles of a DEVORA Researcher and an Emergency Manager (July 2014)
Geologist Sandie Will, author of the Rock-Head Sciences blog, profiled Elaine Smid as part of her 'A Day in the Life' series. Elaine gave a summary of her typical work day for DEVORA. Richard Woods, the DEVORA Steering Committee member representing the Auckland Council Emergency Management and Civil Defence Group, also participated in the series. Together these interviews give a great summary of research and policy roles and how they interact cooperatively. The blog is aimed at students and others interested in geology.

- **Research Assistant, Volcanic Hazards, Elaine Smid @lavabombs: A Day in the GeoLife Series** (Rock-Head Sciences, 21/7/2014)

- **Manager, Emergency Mgmt, Richard Woods @RichardWoodsNZ: A Day in the GeoLife series** (Rock-Head Sciences, 28/7/2014)

Auckland ash clean up research (July 2014)

DEVORA MSc Josh Hayes won the University of Canterbury's Tweet Your Thesis contest for tweeting about his Auckland ash cleanup research:

- **Canterbury research into Auckland eruption cleanup** (*Scoop*, 13/07/2014)

Ash clean-up of Jacobacci, Argentina after the 2012 eruption of Puyehue-Cordón Caulle Volcanic Complex, Chile.

Auckland Evacuation: What to expect (April 2014)

A journal article by UoA's Erik Tomsen and other DEVORA researchers was published. The article summarizes Erik's MSc project examining transport patterns during an evacuation due to a volcanic eruption in the Auckland Volcanic Field:

- **Life won't stop in an eruption** (*Stuff*, 18/04/2014)

Drilling into the Past: Rangitoto Volcano (February 2014)
There was a great level of interest in this EQC-funded study led by Phil Shane at the University of Auckland:

- **Rangitoto gives clues on next blast** (*New Zealand Herald*, 12/02/2014)
- **Drilling begins to study Rangitoto's explosive history** (*New Zealand Herald*, 11/02/2014)
- **Drilling Rangitoto** (*TVNZ*, 14/02/2014)
- **Scientists look at risk of Rangitoto eruption** (*TV3 News*, 11/02/2014)
- **Drilling on Rangitoto Island** ('Our Changing World' and 'Afternoons' Programs, *Radio New Zealand National*, 19/03/2014 and 20/03/2014)
- **Drilling into the past for the future of Rangitoto** (*Newstalk ZB,* 12/02/2014)
- **Rangitoto's buried past may reveal future eruption risk** (*Scoop*, 11/02/2014)

2013

Volcanic Risk Forum makes headlines (September 2013)

The sixth annual **Auckland Council** **CDEMG-DEVORA Forum** on Friday, 27 September was covered by numerous print and television media outlets:

- **Auckland the most unprepared for a disaster** (Stuff, 27/09/2013)
- **Eruptions on the agenda** (Stuff, 26/09/2013)
- **Hon. Nikki Kaye Speech: Managing Volcanic Risk in Auckland** (Scoop, 27/09/2013)
- **Aucklanders warned about risk of volcanic eruptions** (NZ Herald, 27/09/2013)
- **Aucklanders warned of volcanic risk** (Otago Daily Times, 27/09/2013)

Predicting big natural events **(May 2013)**

The two felt earthquakes in March prompted the public to wonder if they were related to the AVF. CDEMG Controller and DEVORA Steering Committee member Clive Manley was featured in an article about earthquakes and volcanoes in Auckland. Clive described some of the research taking place through DEVORA.

Researchers image the volcanic subsurface in Auckland – VIDEO **(April 2013)**

DEVORA researchers Dr Darren Gravley (University of Canterbury) and Elaine Smid (University of Auckland) were interviewed about using ground penetrating radar on

destructive volcanic flow (called a 'base surge') deposits from Auckland's volcanoes. The technique will help us identify potential impacts from base surges in future eruptions.

Prolonged activity at Rangitoto? (April 2013)

In 2009, DEVORA MSc student Andrew Needham **discovered** that Rangitoto Volcano had erupted twice —once about 600 years ago, and then again 50 years later, about 550 years ago. Now, **the discovery of minute layers of ash** found in a core from Lake Pupuke indicates that it may have erupted several times earlier. For more information, check out the press describing the research article:

- **Auckland eruptions 'could go on for long time'** (Radio NZ, 11/04/2013)
- **Rangitoto erupted semi-continuously** (NewsTalk ZB, 11/04/2013)
- **Rangitoto erupted frequently from about 1500 years ago to 500 years ago and wasn't just formed 500 to 550 years ago, say Auckland University scientists** (NZ City, 11/04/2013)
- **Auckland eruptions could last longer** (TVNZ, 11/04/2013)
- **Rangitoto research prompts rethink of Auckland volcanoes**(Voxy, 11/04/2013)
- **New volcano research prompts re-think** (NZ Herald, 11/04/2013)
- **Rangitoto 'could blow again'** (Stuff, 11/04/2013)

Auckland earthquakes generate interest in the Auckland Volcanic Field (March 2013)

The earthquakes in Auckland on Sunday, 17 March sparked interest in other natural hazards that could occur in Auckland, such as a volcanic eruption. DEVORA researchers Dr Jan Lindsay and Darren Gravley were interviewed about the effect of an eruption on Auckland.

- ***Is Auckland ready for a natural disaster?*** (New Zealand Herald, 29/03/2013)
- Dr Jan Lindsay describes how **underground monitoring and careful logging of borehole data are scientists' best predictor of future volcanic behaviour in Auckland** (New Zealand Herald, 28/03/2013).

2012

TVNZ's Close Up segment highlights the volcanic risk to Auckland VIDEO (Oct 2012)

Professor Shane Cronin was interviewed for a feature on Auckland's volcanoes for **TVNZ's Close Up programme**. The programme also featured interviews with Clive Manley, Auckland Council's CDEM Controller and DEVORA Steering Committee member (Auckland Volcanoes feature starts at 8mins 30 secs). Several news articles have highlighted research examining Auckland's susceptibility to lava flows carried out by our partners at Massey

University's **Volcanic Risk Solutions**. The researchers found that in central and northern Auckland, lava would likely be channeled between ridges, while in the flat areas of southern Auckland, the flows would spread out more but not travel as far. The study cited 6.5 km as the maximum lava flow length expected in central Auckland, based on topography, building density, and previous lava flow characteristics. You can read the **original article**.

- **Where would the lava flow in Auckland?** (NZ Herald, 22/08/2012)
- **500,000 people in lava's line of fire** (NZ Herald, 23/08/12)
- **Lava could extend 11 km in Auckland** (NewsTalk ZB, 22/08/2012) [*Note from DEVORA researchers*: *The study cites 6.5 km as the maximum lava flow length expected from future eruptions. The longest flow known from a previous Auckland eruption is 10-11 km, most likely from Mt St John*.]
- **Auckland volcano danger drowned out** (Stuff, 23/08/12)
- **No warning before volcanic eruption** (Stuff, 23/08/12)
- **Volcanic eruption could take Auckland by surprise** (TVNZ One News, 23/08/12)

What does the Tongariro eruption mean for Auckland? (August 2012)

The eruptions at White Island and Mt Tongariro in early August 2012 renewed interest in the Auckland Volcanic Field. The activity in the central North Island **does not** affect AVF volcanism, but if ash-producing eruptions at Tongariro continue and the wind direction shifts northward, ash from Tongariro could reach Auckland. Major disruptions in aviation schedules would be expected in that case. You may read about the effects of ash fall, and how best to protect yourself and your property, **here**.

Many DEVORA researchers are involved in the investigations and response. An excellent compilation of several of their expert opinions can be found at **Tongariro volcanic eruption and ash fall — experts respond.** (Science Media Centre Blog, 7 August 2012) Clive Manley, Manager of Auckland Council's Civil Defence and Emergency Management and member of the DEVORA Steering Committee, explained how **Civil Defence takes preparation for a volcanic eruption in Auckland very seriously** (TV3, 8 August 2012). Some of the expected effects of an Auckland eruption are described in this **article** (NZ Herald, 11 August 2012). Fortunately, no one was hurt in the Tongariro eruption. If a similar event occurred in Auckland, however, how would we fare? Various **DEVORA researchers comment on Auckland's preparedness in light of the unpredictability of volcanic eruptions** (NZ Herald, 12 August, 2012). Please refer to GNS Science's GeoNet webpages for up-to-date information regarding the **Tongariro** and **White Island** eruptions.

The economic impact of an eruption in Auckland (July 2012)

Radio NZ: **Professors Ian Smith and Shane Cronin describe how an Auckland eruption would affect the economy** (18 July 2012, "Auckland Stories" section).

Lessons from Chile eruption for Auckland (June 2012)

Drs Tom Wilson (University of Canterbury) and Carol Stewart visited Chile to investigate the effects of ash from Puyehue-Cordon Caulle Volcano's eruption in Chile over the past year. The **article** (Stuff, 07/06/2012) highlighted lessons for Auckland that were gleaned from their trip to the area.

2011

New Study Revises Eruption Evacuation Radius (December 2011)

In a new study, Dr Gill Jolly and others simulated a **base surge** resulting from an AVF eruption. They found that the previously estimated evacuation radius of 5 km may not be enough in some instances. **Read the article** (Stuff, 4/12/2011). The published article may be found **here** (Springer, Bulletin of Volcanology, DOI: 10.1007/s00445-011-0556-y).

New Volcanoes for the Auckland Volcanic Field (November 2011)

Dr Bruce Hayward (**Geomarine Research**) has recognized several more volcanoes in the Auckland Volcanic Field. Hear about how he found them and confirmed his suspicions on Radio New Zealand's reports: ***Morning Report*** (3:52; *New volcanoes discovered in Auckland*: 9 November 2011). ***Our Changing World*** (14:56; *Auckland's new volcanoes*: 10 November 2011) News articles: ***Four new volcanoes found under Auckland***. NZ Herald article, 9 November 2011. ***New volcanic craters discovered in south Auckland***. NewsTalkZB article, 10 November 2011. The news was mentioned in another article announcing a new IESE project to install seismometers in two additional locations in Auckland: ***$2 million to dig up city secrets***. Stuff, 11 November 2011. Information about the new volcanoes was presented by Bruce to other researchers at the**4th Annual DEVORA-IIOF Research Forum on 10 November**. Just prior to the discoveries, Dr Hayward also **published a book**which features descriptions of each volcano in the AVF, their rich heritage, and what we currently know about eruptions in the AVF and monogenetic fields in general. DEVORA researchers and their research findings contributed to the content.

Grafton Volcano Re-Discovered (April 2011)

Hear DEVORA Volcanologist **Dr. Jan Lindsay** (University of Auckland) discussing the rediscovery of a volcano at Grafton in central Auckland under the medical school. (8.01;*Grafton Volcano*: Audio from Afternoons on 05 Apr 2011) **Hear** Dr. Bruce Hayward, Geologist of **Geomarine Research**, talk about the volcanic puzzle of rediscovering the Grafton volcano by linking lava flows between boreholes and measuring changes in the thickness of the lava flows and volcanic ash. (7.34; Audio from Nine To Noon on 05 Apr 2011) News articles:

- **NZ Yahoo!**
- **Scoop**

- **Stuff**
- **TVNZ**
- **GNS Science Media Release**
- **NZ Herald**
- **Radio NZ**
- **3 News**

2010

Prepare for an Auckland Eruption (October 2010)

New Zealanders can watch TV3's online version of ***Eruption***, a docu-drama detailing an eruption scenario in Auckland. The trailer can be seen worldwide **here**. Several members of the DEVORA team were involved in advising the directors about the scientific details and eruption timelines. Links **1** and **2** give more information and describe what you could do to prepare for a volcanic eruption in Auckland. GNS Science posted two press releases in preparation for the screening of *Eruption* on 13 October–see **press release 1** for information about our current research findings and **press release 2** to find out how GNS is watching out for us via seismic stations. Shortly after the docu-drama on TV3, experts from GNS Science were live on Facebook answering questions at **http:/www.facebook.com/geonetnz**. See the Discussions tab for the Q&A.

New Ash Layers Uncovered (October 2010)

Hear DEVORA Volcanologist Dr. Gill Jolly (GNS Science) discuss the impact of finding 29 new ash layers in Auckland on Radio New Zealand National's *Checkpoint* programme (17:53; *Auckland more vulnerable to volcanic ash fall than thought*; 13 October 2010).

What to Expect Before an Eruption (October 2010)

Listen to DEVORA volcanologists Drs Gill Jolly and Jan Lindsay talk about what we expect from the next volcanic eruption in Auckland on Radio New Zealand's *Checkpoint* programme (3:35; **Seismic studies shed light on natural disaster risk**; 13 October 2010).

Hazard and Risk in Auckland (September 2010)

Learn the difference between 'hazard' and 'risk' as **Jan the Volcanologist** talks about the magma beneath Auckland's volcanic field on 96bFM (15 September 2010). **Listen** to Dr. Ian Smith compare and contrast the AVF with Iceland's volcanoes and explain more about the

DEVORA objectives on Australia's **ABC Radio National on The Science Show**. (8 min.; 4 September 2010).

Ever Wondered? Find out here. (August 2010)

Watch DEVORA scientists Aleksandra Zawalna-Geer, Drs. Jan Lindsay, Phil Shane, and Tom Wilson in action as they illustrate the hazards facing Auckland from an eruption on an episode of TVNZ 7's 'Ever Wondered?' Also, Dr. Liam Wotherspoon, an IESE scientist, explains how we'd locate the site of an impending eruption using seismometers. (Sections 2 and 3; 28 Aug 2010).

Volcanoes in the Big Smoke (August 2010)

Hear Dr. Jan Lindsay talk about 'Volcanoes in the Big Smoke' on 'Ready Steady Learn' on 96bFM (15 min. 24 sec.; 24 Aug 2010).