



UNIVERSITY *of*
TASMANIA

Friday 10 May 2019

Scientists pioneer new method to predict volcano eruptions

Tasmanian scientists have pioneered a new method to help predict when volcanoes will erupt, analysing data from the 2018 eruption of Kilauea volcano in Hawaii.

University of Tasmania's School of Physical Sciences adjunct researcher Dr Gerrit Olivier and Dr Rebecca Carey from the Centre for Ore Deposit and Earth Sciences (CODES) joined colleagues from France, UK and America to analyse data obtained from the eruption in a bid to better understand and predict when volcanoes will erupt.

Using Kilauea volcano as a case study, researchers analysed background vibrations, resulting from the spluttering of the lava lake and ocean waves hitting the island's shore, to measure tiny changes in the speed that vibrations (or seismic waves) travel through the volcano.

These changes in wavespeed revealed a dramatic change of the magma plumbing system inside the volcano 10 days before the May 3 eruption last year.

"The volcano is constantly bulging and contracting as the pressure inside the magma chamber changes," Dr Olivier said.

"The behaviour of the seismic wavespeeds are initially quite predictable. When the volcano bulges, the speed at which the vibrations travel through the volcano increase slightly as material is compressed. On the other hand, when the volcano contracts these wavespeeds decrease.

"What we found is about 10 days before the eruption this behaviour changed quite dramatically.

"The volcano was still bulging due to the build-up of pressure inside the magma chamber, but the seismic waves were slowing down quite dramatically, instead of speeding up."

Volcanic eruptions generally occur when pressure within the magma chamber exceeds the strength of the surrounding material. The researchers think that this

change in the behaviour of the wavespeeds could be a sign that an eruption is imminent.

“We think that this is a good indicator that the volcano isn’t able to sustain the pressure inside the magma chamber anymore, that the bulge is too big and it starts breaking the material around the magma chamber which ultimately leads to the eruption,” Dr Olivier said.

Although these changes have been shown for some eruptions at other volcanoes in the past, the researchers were the first to show that these changes occur due to weakening of the material inside the volcano prior to an eruption.

Kilauea is monitored by the Hawaiian Volcano Observatory and is incorporated into one of the world’s most technologically advanced geophysical monitoring networks.

The 2018 Kilauea eruption was the largest at the site in 200 years. The eruption on May 3 last year saw 800 million cubic metres of lava flow for three months and the destruction of more than 700 homes.

The research, [Decrease in seismic velocity observed prior to the 2018 eruption of Kilauea volcano with ambient seismic noise interferometry](#), was published in Geophysical Research Letters.

For media queries/interviews contact: Dr Rebecca Carey - 0487 403 164/
Rebecca.Carey@utas.edu.au

Information released by:
Communications and Media Office
University of Tasmania
+61 3 6226 2124
Media.Office@utas.edu.au
[Twitter.com/utas_newsroom](https://twitter.com/utas_newsroom)