Predicting the big one

January 28 2009

Predicting when a volcano will erupt is the aim of advanced research currently being undertaken by Victoria University's School of Geography, Environment and Earth Sciences.

Professor of Geophysics, Martha Savage, recently spent five months in Japan where she studied the stress on four volcanoes.

"We found that stress on volcanoes can be monitored by seismic anisotropy, or what happens when a wave travels faster in one direction than another," says Professor Savage.

"The difference is most likely caused by stresses closing cracks in particular directions. We were able to measure the background stress changes around volcanoes in Japan and the US, leading up to, and between, eruptions over time, which is allowing us to understand the underlying changes in movement that may eventually lead to volcano prediction tools."

Professor Savage says the Japanese and US studies developed from a programme closer to home, where she has been looking at the 1995-1996 eruptions of Mt Ruapehu.

"These eruptions occurred with no medium-term warning. If seismic anisotropy can be shown to be an effective stress indicator on other volcanoes, then we can use it to monitor stress on New Zealand volcanoes. Stress changes may also be related to geothermal activity and to earthquakes, with potential applications for seismic anisotropy to be

used in energy production and earthquake prediction."

Professor Savage's research is one of the few seismic studies conducted on volcanoes, and it puts the Wellingtonian among the world's foremost earth science researchers.

Her recent research trip allowed her to visit universities in Kyoto, Tokyo, and Kyushu Island, and to travel to four volcanoes - Mt Asama, Mt Aso, Mt Unzen and Sakurajima.

"It allowed me to apply techniques that I had developed on one volcano in New Zealand to many other volcanoes in Japan. With the proof that the techniques are working, it is likely that the rest of the world will move forward to develop the technique further, hopefully being able to use it as another tool in volcano eruption prediction."

Provided by Victoria University of Wellington