Hazardfacts

Auckland Regional Council
TE RAUHITANGA TAIAO

Auckland's Volcanic Hazards

Aren't Auckland's volcanoes extinct?

Not exactly. Auckland's existing volcanoes are unlikely to become active again, since they all follow a pattern of short eruptions, but the Auckland Volcanic Field itself is young and still active, meaning new volcanoes could appear with little warning. In a city of a million people, even a small and brief eruption would be a major event.

How would a new eruption happen?

In the past, Auckland volcanic eruptions have been of two main types. The first is a short explosive eruption, caused when molten rock meets ground water, blasting out steam and other gases, fragmented lava, and rocks. Such eruptions have typically produced nearly circular craters up to a kilometre in diameter surrounded by a ring of solid debris. Lake Pupuke and Orakei Basin are examples of such volcanoes.

The second type of eruption is driven by the release of gases from the liquid rock as pressure on it lessens near the surface. The result is 'fire fountaining' - fountains of lava that build up a cone of solid material known as a scoria cone. When there is a lot of lava, lava flows may spill out into the surrounding area. One Tree Hill is a good examples of this type of eruption. Many of Auckland's volcanoes are a combination of both types (refer Hazardfacts H02 - How do Auckland Volcanoes Form?).

What are the primary hazards from such eruptions?

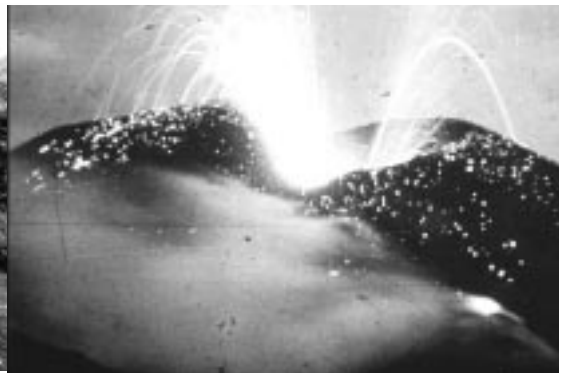
The most serious hazard from a new eruption would be the effects of the initial explosion. A hot blast of rock, gas and steam would travel outward horizontally at hundreds of kilometres per hour, devastating an area around 3km from the vent. Called 'base surges', the only practical step to avoid them is to evacuate all areas likely to be affected.

Then, from a vertical eruption cloud, small debris and ash would fall downwind, hindering visibility and causing breathing problems. Volcanic ash is very abrasive, damaging machinery, and is also harmful to plant and animal life. It can cause lightning strikes and the weight of large ash deposits, especially when wet, often causes roofs to collapse. During an eruption, ash and other debris need to be removed from roofs and roads. Protective clothing and respiratory devices will need to be worn by people involved in the clean up. Drinking water supplies will need to be protected from contamination, and there are likely to be problems with power and communication.

Fire fountaining would present a much lower hazard, since it would be restricted to the vent area. The falling rock fragments associated with the fountaining, may be of sufficient size to cause injury, but only near the vent, and people would have already been evacuated. Any lava flows are likely to be slow moving, but would eventually destroy structures in their path.

There is also a risk from ash from distant eruptions in the central North Island and Mt. Taranaki. Deposits of ash up to 60 cm thick from Taupo eruptions are found in the Auckland area. Ash from such eruptions would affect the entire Auckland region, unlike the more localised effects of eruptions from the Auckland Volcanic Field.

Lava flow consumes vegetation, Mauna Ulu, Hawaii, 1974 (U.S. Geological Survey)



Fire fountaining, Stromboli, Italy, 1951 (Howell Williams)

What other hazards might there be?

Secondary hazards from volcanic activity could include: shock waves from explosions, which can flatten trees and break windows; poisonous gases near the vent or collecting in low lying areas; localised earthquakes; and small tsunami caused by underwater eruptions.

How would a new eruption happen?

It is possible. As rising magma makes its way through the earth's crust, small tremors are created which can be detected by sensitive motion detectors called seismometers. An eruption in Auckland could be expected to occur after several days to a few weeks of such tremors. The Auckland Regional Council monitors seismic activity in the Auckland area to provide advance warning of any volcanic activity (refer Hazardfacts H05 - Auckland Volcano-Seismic Monitoring Network).

References and further reading:

Cox, G.J. (1989) Fountains of Fire: The Story of Auckland's Volcanoes. William Collins Publishers Ltd, Auckland.

Johnston, D.M., Nairn, I.A., Thordarson, T., Daly, M. (1997) Volcanic Impact Assessment for the Auckland Volcanic Field. Auckland Regional Council Technical Publication No. 79, April 1997.

Smith, I.E.M. & Allen, S.R. (1993) Volcanic Hazards at the Auckland Volcanic Field. Civil Defence Volcanic Hazards Information Series, No. 5, CD 304.

Hazardfacts in the volcano series: H01 (Auckland's Volcanic Field), H02 (How do Auckland Volcanoes Form?), H03 (Rangitoto: Auckland's Youngest Volcano), H05 (Auckland Volcano-Seismic Monitoring Network), H10 (Volcanic Eruption in Auckland).

http://www.arc.govt.nz/volcanic

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