

AUCKLAND'S VOLCANOES

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This paper is based on a brief presentation made by the author, at the AGM of Civic Trust Auckland, in November 2006. The presentation was called "*How many volcanoes are there in Auckland*", a non-technical talk by a lay person, intended to show the rudiments of the subject. Props used comprised three books and a paper cutout.

The question "how many volcanoes are there an Auckland", is deceptively simple. The audience appreciated quite early on that the answer would depend on the definition of volcano, which in Auckland is quite true, as it is difficult to distinguish individual volcanoes from clusters, making up a single volcano. I permitted some leeway in this matter and allowed the count to include volcanoes destroyed or badly disfigured by human development. Bids were accepted from the floor, starting from 14, the number of volcanic features readily distinguishable from the summit of Maungawhau/Mt Eden. As would be expected, the audience was not without some knowledge and there were, accordingly, hearty calls in the range 45 to 60, at which point bids petered out.

The audience was then invited to indicate how many answers there might be to this question and were surprised to learn that, although the answer depended to some extent on the definition of the term "volcano", the answer was far more dependent on the definition of the term "Auckland".

If the term "Auckland" describes that part of Auckland city comprising the Isthmus, then the answer is, in round figures, more than 20, possibly more than 25. As with all answers to this question, the exact number cannot be known with certainty and additional suspected sites might yet be proven in due course. Of many suspected sites, three are worthy of mention, namely the low depression near the Epsom community Centre in Gillies Avenue (the possible site of an explosion crater), the grounds of Pah homestead, located on the site of Whataroa pa, at Monte Cecilia, Hillsborough, where ground radar indicates possible lava flow and Jellicoe Park, an elevated knoll in Onehunga.

If "Auckland" is defined as the area administered by Auckland City Council, then it will include the islands of the Hauraki Gulf. There are for example, volcanic features on Waiheke (at Stony batter), Aotea/Great Barrier, Little Barrier, Motu Korea/Browns and elsewhere. Clearly this particular answer is probably in excess of 40, possibly far in excess.

If "Auckland" is defined as the Auckland region, for example the area administered by the Auckland regional Council, then it will be necessary to include the volcanoes of Northern Franklin, at places such as Pukekohe and Red Hills, Papakura, also the many volcanoes located in the Waitakere ranges. If the "Auckland region" includes also the southern part of Franklin district, then it will also include the many volcanoes extending

around from the mouth of the Waikato to the Hunuas. This fourth definition gives the largest answer to the question, of which the exact number is unknown, probably unknowable, but likely to be well in excess of 200.

At this point it is worth noting that there is a geological meaning to the term “Auckland”.

The Auckland volcanic field comprises an ellipse, centered about Green Lane and extending from Lake Pupuke in the North, to Wiri, in the south. At this point a paper cutout can be used to demonstrate the scale of this field. If the cutout comprises the central North Island volcanoes Ruapehu, Ngaruahoe and Tongariro, it will come as a surprise to many that by demonstrating a simple map overlay, the Auckland field is of similar size to these three volcanoes. The Auckland field comprises the youngest of the volcanoes located within the Auckland region. They are extremely young in geological terms. For some, exact dates cannot be given, for example it is currently thought that the oldest ones in the Domain (Pukekaroa) and near Albert Park in the City (Rangipuke) are between 100,000 and 150,000 years old. The youngest, Rangitoto would seem to have erupted as recently as about 600 years ago, certainly after the arrival of Maori, as footprints have been found beneath volcanic debris, on the adjoining island of Motutapu.

There is another volcanic area known as the *South Auckland field*, which is centered just east of Pukekohe and extends around from Drury to just north of Rotowharo. These are of intermediate age by local standards, ranging from about half a million years to 2 million years. This field alone numbers about 97 volcanic features, with a number discovered recently, suggesting that the field contains over 100.

In addition to those which are counted above, there are a number situated in the Tasman Sea to the west of Auckland. A huge volcano, given the geological name *Manukau* is situated west of Piha. The Waitakere volcanoes are situated on the eastern flank and comprise part of this big undersea feature, which is old by local standards, contemporary with the Coromandel volcanoes, at about 17.5 to 20 million years. Manukau volcano is about the size of Lake Taupo. Many other volcanoes are located in the sea off the west coast of the North Island.

Hence there are seven answers to this question.

Civic Trust Auckland has an active *Volcanic features protection* subcommittee chaired by the author, which has spent much of the 2006 year trying to protect Te Tauomo/Purchas Hill, just north of Maungarei/Mt Wellington. Auckland City Council, which had originally proposed to construct a four-lane highway (the first portion of the eastern corridor) through the middle of this small remaining volcanic remnant, has now promised to retain the remnant and a small surrounding reserve. Mayor Dick Hubbard has confirmed that his intervention in the matter has made this possible, prompted by submissions from the *Volcanic Cones Society*, the *Geological Society of New Zealand*, my subcommittee of *Civic Trust Auckland* and many others.

There are many volcanic features currently at risk throughout the Auckland region. In some localities it might be possible to contemplate reinstatement, indeed, the *Geological Society of New Zealand* favours reinstatement for Te Tauomo. Repair and reinstatement are quite possible for Maungataketake, Matuku/McLaughlins and many others. Our subcommittee and several kindred societies have much work to undertake in the years to come.

The *Geological Society of New Zealand* has helped identify and currently maintains the **New Zealand Geopreservation Inventory**, which is a list of geological features from throughout New Zealand, considered to be the best representative examples of important earth science features. Many of these are located within the Auckland region and Civic Trust Auckland supports the *Geological Society of New Zealand* and other interested parties in their attempts to preserve these landscape artefacts.

For those interested in learning more about the volcanic features of the Auckland region, there is a good specialist display in the museum, including a short digital film showing the main volcanic eruptions around New Zealand, in order, starting from about 25 million years ago.

There are numerous books on the subject including *City of Volcanoes* by E J Searle, 1964, subsequently amended and updated, *Geology of the Auckland urban area* by L. Kermode, 1992 and *Fountains of Fire* by G. J. Cox, second edition 2000. *Fountains of Fire* is a superbly illustrated book which describes the nature of the Auckland volcanoes in plain language. For those who wish to dig a little deeper into the subject, I would highly recommend *Geology of the Auckland area* compiled by S. W. Edbrooke for the Institute of Geological and Nuclear Sciences, 2001, again, very well presented and including a foldout map.

Further excellent, more technical data can be downloaded from the Internet. For example there is a good basic text covering the *South Auckland field* from the *New Zealand Journal of Geology and Geophysics*, 1994, volume 37. This and other learned texts are available from the website of the *Royal Society of New Zealand*. See also the website of Auckland Regional Council. The ARC website is quite comprehensive. It clearly notes 49 volcanoes within the Auckland field and groups them by age (less than 10,000 years, 10,000 to 20,000 years, 20,000 to 100,000 years and over 100,000 years). It also notes that volcanoes represent a hazard within the Auckland region. The system is clearly alive, as indicated by hot water springs in locations such as Waiwera, Parakai and Miranda.

The geological building blocks, which make up the bedrock of the Auckland region, represent a fascinating subject, well worthy of further study.