

BASELINE SEISMICITY IN THE AVF

DEVORA OUTCOME 1, 1.4: WE HAVE A GOOD UNDERSTANDING OF THE CRUST
(TASK DEV318)



Photo courtesy: Bruce Hayward

Project Background

Volcanism is often accompanied by increased seismicity

Allow us to understand what is considered normal levels of seismicity for Auckland providing:

- Key input to eruption scenarios
- Baseline activity to aid in decision making
- Shake/liquefaction potential, building code development, earthquake hazard mitigation

This project will involve collating info regarding frequencies, depths and magnitudes of earthquakes which **affect** Auckland



Photo courtesy: Bruce Hayward

Data sources

Historical records (pre-instrumental data)

- felt reports
- newspapers
- letters

EARTHQUAKE AT Nelson N.Z. Date of Shock 18 Jan 1901
[Please answer precisely any or all of the following Questions.]

1. Time of beginning of shock. (If possible, N.Z. Mean Time, to nearest quarter of a minute.)	<u>10.2 am</u>
2. Whether clock was verified by N.Z. Mean Time.	<u>yes</u>
3. Apparent direction — (e.g. S.E. to N.W.; then N.E. to S.W.)	<u>north & south</u>
4. Apparent duration of shock	<u>4 seconds</u>
5. Effects. — (e.g. — (a) Felt by persons in motion; disturbance of movable objects, doors, windows, cracking of ceilings. (b) Felt generally by everyone; disturbance of furniture and beds, ringing of some bells. (c) General awakening of those asleep; general ringing of bells, oscillation of chandeliers, stopping of clocks; visible disturbance of trees and shrubs. Some start of persons leave their dwellings. (d) Overthrow of movable objects, fall of plaster, ringing of church bells, general panic without damage to buildings. (e) Fall of chimneys, cracks in the walls of buildings. (f) Destructive damage.	<u>no</u> <u>no</u> <u>no</u> <u>no</u> <u>no</u>
6. Remarks. (e.g. previous or subsequent tremors; spilling of liquids, with direction of overflow, rumbling before, during, or after shock.)	<u>nil</u>

N.B.—The N.Z. returns are valuable not only in themselves, but as part of a world-system of seismological observations, and your attention is called to the fact that the reliable character of the record depends upon the individual accuracy of each observer. No shock, however slight, should be omitted.

Signature of Observer H. Gardner
Address Nelson
Date 18th January 1901

THE EARTHQUAKE.

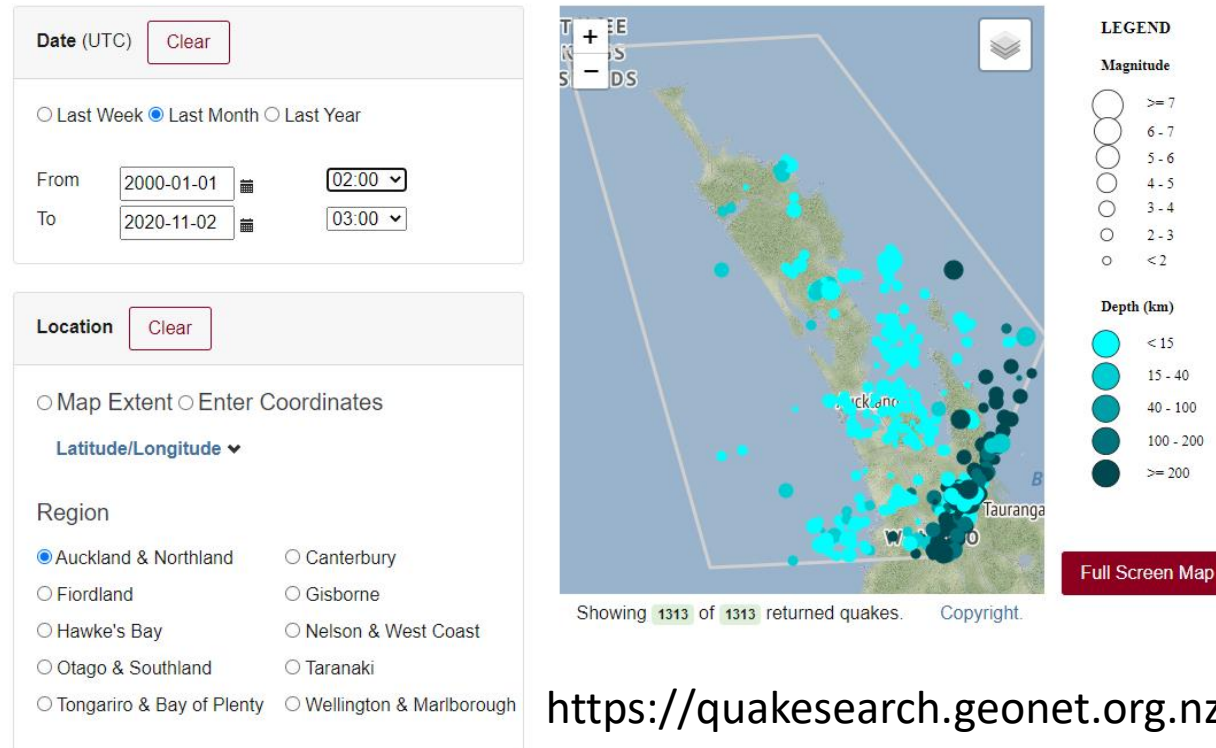
FELT IN AUCKLAND.

A number of residents of the Mount Eden district, in the neighbourhood of Balmoral Road and Windmill Road, report that they felt earthquake tremors between 1.30 and 2 o'clock this morning. The evidences were unmistakable though quite slight.

Creaking doors and a slight swaying motion were the signs that accompanied the disturbance. They were of scarcely more than a minute's duration but were quite definite. It was a particularly calm night and the conditions were unusually good for observing earthquake movements.

Data sources

Seismic Data (instrumental data)



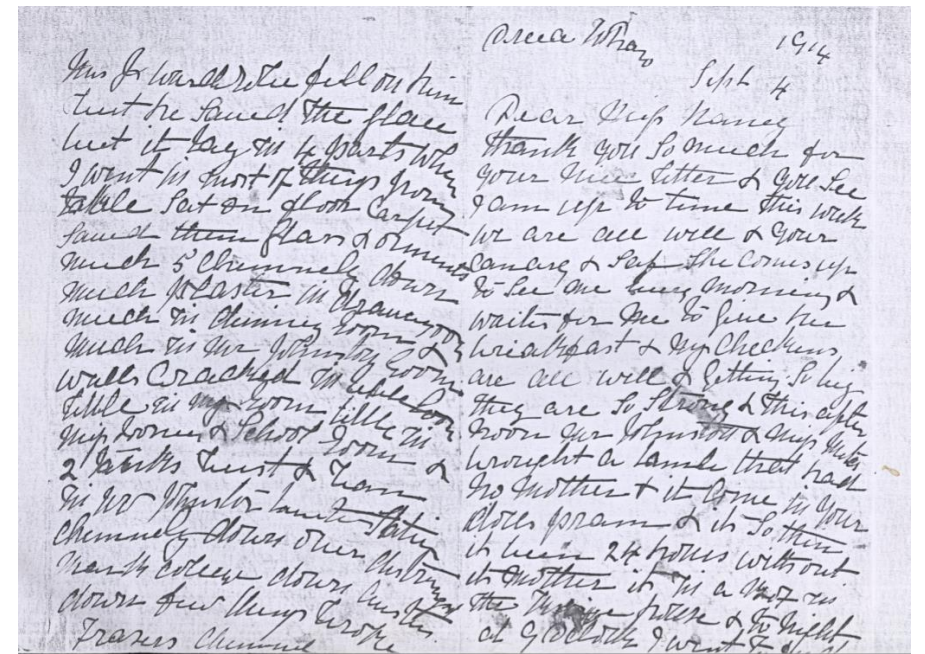
<https://quakesearch.geonet.org.nz/>

Problems Encountered

1. How to quantify fainting?? Historical dataset inaccuracy or difficulties
2. Large datasets
3. Discrepancies between datasets

Three earthquake shocks were felt at 3 a.m. 6 a.m. and 11 p.m. yesterday. The first was the most severe and had a similar motion to that felt a week ago.

(By Telegraphn.—Own Correspondent.)



Courtesy of GeoNet and Te Papa Museum

there were cases of women fainting.

Major outcomes from this project

- Given the size of datasets and discrepancies between data sourced from the pre-instrumental period and instrumental period, it is recommended that this project is split into two projects
- Possibility of improved earthquake hazard assessments for Auckland region
- Improving readiness for eruptions in Auckland
- Contributing to the nationwide earthquake database