

Interactive comment on “Seismic monitoring of the Auckland Volcanic Field during New Zealand’s COVID-19 lock-down” by Kasper van Wijk et al.

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Overall, the manuscript is written well and provides interesting insights into seismic noise related to human activity. I have some minor comments.

Thank you, reviewer 1.

1. Frequency band.

A main frequency band is 0.1–50 Hz, which seems to include a variety of seismic noise including microseisms, local earthquakes, human activity. I wonder if the authors provide several frequency bands (1–10 Hz, 5–15 Hz, 10–30 Hz for

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example) that may allow us to understand the nature of the ambient seismic noise at the seismic stations.

2. Power spectral density plot.

Related to #1, I think it would be informative to include power spectral density (PSD) plots (with monthly to yearly data before the COVID-19 lockdown) for each station, which would provide the baseline of ambient noise level.

To address the reviewers comments (echoed by the other two reviewers), we added PSD plots in an appendix to show that the anthropogenic component of the noise is at 1 Hz and higher. How high is not exactly clear, and probably varies a bit across the network, but it appears to approach the Nyquist frequency of 50 Hz. Because we are interested in earthquakes *and* volcano monitoring for the AVF, we analyse the entire frequency band of our recordings as one.

3. Mobility data (work places)

I see the work places data show noise reduction over weekend before the level 4 COVID-19 lockdown but it appears that the work places data periodically increase weekend after the level 4? I may have missed but it would be good to have some comments in the revision.

Yes, we added an explanation in the revised manuscript. The key is that the mobility data is presented as a “change” in mobility. Overall, work place activity dropped significantly during the lockdown, but essential services continued. During the weekend, essential services make up a large fraction of workplace activity during normal times, and this is even more so during a lockdown when non-essential services cease to happen. The text in the new manuscript reads:

“Because the mobility data is presented as a change in activity, the workplace activities

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dropped overall, but work deemed essential continues in the weekends, resulting in a temporary increase in weekend workplace activity during the lockdown period.”

Interactive comment on Solid Earth Discuss., <https://doi.org/10.5194/se-2020-152>, 2020.

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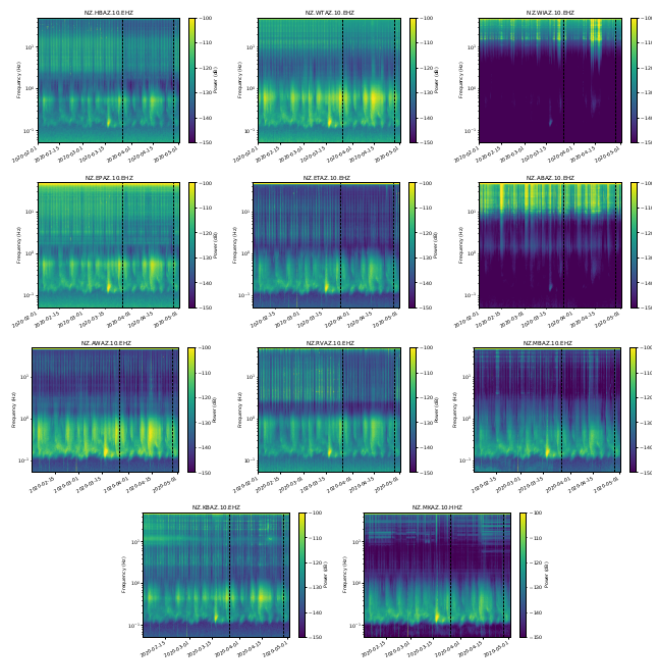


Figure A1. Spectrograms for the seismic data of the Auckland Volcanic Seismic Network. The vertical dashed lines indicate the start and end date of the COVID-19 lockdown in New Zealand.

Fig. 1.

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