Dear Editors,

Thank you for acceptance of our manuscript to Earth Surface Dynamics. Please find below our responses to your review (as before, responses are in red italic). We have addressed all comments, and agree with the majority of suggestions.

Please let us know if further information is needed, or if there are any questions.

Thank you,

Daniel O'Hara (corresponding author)
Liran Goren, Roos M.J van Wees, Benjamin Campforts, Pablo Grosse, Pierre Lahitte, Gabor Kereszturi, Matthieu Kervyn

Figure 1: Explain hillshaded relief and describe the insets in the caption. Consider using lat/long on the insets (or in caption) so the whitespace can be decreased to make the panels bigger. consider using a single colour-scale for every panel so they can be compared.

Hillshaded relief, map projection, and inset description has been added to caption. All maps are now given the same color scales. Axes titles have been removed from the inner sections of panels to decrease white space.

Line 93: Please briefly state what map projection was used and if any distortion associated (if it was an equirectegular then there will be some distortion for NZ)

Projection description added in both Fig. 1 caption and line 96.

Line 124: Put citation at end of sentence line 128?

Citation put at the end of the sentence (now line 130). This was also completed for the Hack's Law equation (line 120).

Figure 2: Need to explain the projection of the x-y coordinates in metres in the caption (or remove them as the location of the volcano is included on fig 1)

X-Y coordinates removed from the figure, with a scale bar now placed to give distance.

Figure 3: Figures 3 and 4, I would like to see some estimates on uncertainty on the vertical points where SD cannot be calculated (to be detailed in the methods)

After consideration, we disagree with this suggestion to Figs. 3 and 4. The metrics that currently have vertical bars are those that generate a population of values for a single edifice, such that the solid points are the average value and the vertical lines provide the range of values as the standard deviation. This is different from an uncertainty associated with, for example, changing DEM source, altering edifice boundaries, or using a different summit designation. Comparatively, values without vertical bars are singular measurements derived from the edifice's geometry; alterations to their values would thus be associated with the uncertainties previously described. Combining these with the standard deviations presented in Figs. 3 and 4 conflates ideas and would likely lead to confusion.

A sensitivity analysis of the uncertainties above on our values is outside the scope of our manuscript, but is the focus of a companion manuscript by co-author R.M.J van Wees (van Wees et al. in review), *currently in the second stage of reviews in Geomorphology.*

Although we do not provide the suggested estimations in Figs. 3 – 4, we do now list sources of uncertainty and make this difference clear in the Methods (lines 209 – 215). Furthermore, we have added vertical bars to Irregularities and Ellipticity Indexes in Figs. 4, S5, and S6, which were previously not included but do quantify the standard deviations from an edifice-scale population of samples.

Axis ticks barely visible and not at all visible on outlined plots

Axis ticks have been extended to be made more visible.

The empty circles have dots in them on the plots - is there a significance?

This was an artifact of Matlab's errobar function and has no significance to the figure. This has been removed here, as well as in Figs. 4, 7, 8, as well as the supplemental figures.

Figure 4: Axis ticks barely visible and not at all visible on outlined plots

Axis ticks have been extended to be made more visible.

Line 264: Evolution to that observed

Text has been changed (now line 274).

Figure 5 caption: Analysis of our results?

Text has been changed.

Line 290: As the surrounding?

Text has been changed (now line 301).

Figure 6: note that background image is hillshade

Text has been added.

Suggest making panels bigger and removing whitespace by removing the x,y axes - the location of the volcanoes is given in Fig 1. The xy units are not explained (so if kept the projection system used to generate these coordinates needs to be specified).

X-Y coordinates removed from the figure, with a scale bar now placed to give distance.

Figure 7: Delete repeated "log"

Text has been deleted.

Figure 9: See earlier comments about the xy coordinates

X-Y coordinates removed from the figure, with a scale bar now placed to give distance.

Mention semi-transparent hillshaded relief of SRTM

Text has been added.

Reference

van Wees, R.M.J., O'Hara, D., Kereszturi, G., Grosse, P., Lahitte, P., Tourniganda, P.-Y., and Kervyn, M. Towards more consistent volcano morphometry datasets: Assessing boundary delineation and DEM impact on geometric and drainage parameters: Geomorphology, in review.