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Dr. Amy Donovan
Associate Editor
NHESS

Subject: Manuscript submission – Bevilacqua et al.

Dear Associate Editor,
I wish to submit for your consideration our response to the reviews for the manuscript entitled: *Assessing minimum pyroclastic density current mass to impact critical infrastructures: example from Aso Caldera (Japan)*, by Andrea Bevilacqua, Alvaro Aravena, Willy Aspinall, Antonio Costa, Sue Mahony, Augusto Neri, Stephen Sparks, Brittain Hill.

I am attaching a new version of the manuscript, with and without track changes, and a detailed responses letter, in which we have carefully responded to all the comments from the reviewers.

In particular (more details can be found in the responses letter):

1) Our study is not dependent on knowing the volumes of the Aso-4 eruption or its individual flow units accurately. Indeed the volumes have large uncertainties and such estimates are only used to constrain the range of volumes of interest in the modelling.
2) We were sorry to see that reviewer #1 found the most recent estimates of volume and mass erupted in Aso-4 (taken from a peer reviewed paper in the published proceedings of an international workshop) were unsuitable to be referenced in our manuscript. However, we would like to maintain a neutral position in our discussion, and thus wish to at least report those findings. Therefore, we removed these specific data from all figures and most results, but left them in one table, commenting on them as an illustrative example.
3) We did not seek to define the most important infrastructure sites potentially exposed to the PDCs of an eruption like Aso-4, but we selected a number of indicative sites located at similar distance from the Aso caldera and in well-separated directions. To improve clarity we now call them “marker sites” (MS), instead of “target sites” (TS), throughout the manuscript. In line with the reviewer’s suggestions, we have extended our analysis and added two further marker sites, MS4 and MS5, located in new directions.
4) We added new runout probabilities for all five sites based on 1/10th of the Aso-4 PDC outflow volume, tentatively representing the single largest PDC unit of Aso-4; this responds to another substantive reviewer comment, and serves to illustrate what happens if we do not presume the PDC contains all outflow mass but only the most far-reaching unit.

Please do not hesitate to contact me for any further information. Thank you in advance for your consideration.

Yours sincerely
Dr. Andrea Bevilacqua

(on behalf of all manuscript authors)