

***Interactive comment on* “Statistical theory of probabilistic hazard maps: a probability distribution for the hazard boundary location” by David M. Hyman et al.**

Anonymous Referee #2

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The authors present an interesting point of view regarding Probabilistic Hazard Maps (PHM) adopted in the volcanological context. PHM, typically, represent the probability of emplacement of volcanic products on the ground and are built by repeated application of models which explore a set of input parameters. The authors show that the PHM also represents a set of cumulative density function for the location of the inundation boundary. This allows the generation of probability density functions that can be used for further statistical analysis (mean, mode, median and other moments of the position of the inundation front). The authors, unavoidably, adopt a mathematical language often unusual among volcanologists, however I think that the use of examples clarify how the method can be applied.

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I suggest to summarize the method by writing a sort of schematic "recipe", possibly applied to the numerical case, which is more often used in real cases (eg: something like, step_1: definition of the sampled input space parameters; step_2: definition of a threshold for the inundation; step_3: construction of the indicator function by using model simulations; step_4: definition of a set of starting point for the integration of the gradient curves [eq.(37) and eq.(5)], etc., up to the definition of the PDF).

Interactive comment on Nat. Hazards Earth Syst. Sci. Discuss., <https://doi.org/10.5194/nhess-2018-344>, 2018.

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