

## Towards a global volcanic hazards index

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Globally, many people live in areas that have the potential to be affected by volcanic hazards; this number is growing. The need for judgements regarding the extent of these potential hazards is therefore more pressing than ever. When properly understood and communicated effectively, hazard assessments can be hugely beneficial in land use planning during times of quiescence, and in emergency planning during times of unrest.

Focus in this work is on hazard assessment methods applicable at the global scale, to identify volcanoes likely to pose greatest hazard during timescales relevant for risk applications, i.e. one generation (approximately 30 years). These must be computationally simple to ensure worldwide application is feasible, yet capture the complexities of volcanic hazard as fully as possible. A handful of attempts at creating such methods exist, most commonly using an indices structure in which quantitative variables are used to represent different aspects of volcanic hazards. One of the best-regarded of these is the USA National Volcano Early Warning System (NVEWS) of Ewert (2007); more recently, Aspinall et al. (2011) created a new method that addresses some of the shortcomings of the NVEWS method, and was applied to sixteen developing countries.

We continue this iterative procedure of improvements to create a new globally-applicable, indices-based volcanic hazard assessment method. This new method first divides volcanoes into eruption frequency classes, based on the number of eruptions in the volcano's record, the date of the most recent eruption, and unrest since. A score is assigned to each frequency class. Separately, each volcano is scored based on factors reflective of eruption magnitude. These include VEI, and the incidence of pyroclastic flows, lahars, and lava flows. The frequency and magnitude scores are then combined multiplicatively to give the volcano an overall hazard score. We use the Holocene volcano database available from the Smithsonian Institution for consistency and simplicity.

Preliminary testing using well known volcanoes shows promising results, with relative hazard scores in line with expectations. We have used data on the numbers of fatalities caused by pyroclastic flows, lahars, and lava flows (Auker et al., 2013) to inform the weightings of the hazard factors that form the magnitude score.

Our next step is to set a minimum number of eruptions in a volcano's eruptive history below which the amount of data is deemed insufficient for the method to be applied effectively. In cases of insufficient data, a hazard potential score based on the hazard score of "similar" volcanoes will be calculated. The volcano's hazard potential score will then be added to its hazard score to provide an overall hazard summary. This work is currently in progress.

The completed method will be used as part of the UNISDR Global Assessment of Risk Report 2015.