

Estimating volcano hazard and exposure in the Lesser Antilles

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The potential catastrophic effects of future volcanic eruptions in the Lesser Antilles can be decreased by the utilisation of effective risk quantification measures and their subsequent incorporation into disaster risk reduction strategies. A volcanic risk study conducted by the Norwegian Geotechnical Institute (NGI) in collaboration with Bristol Environment Risk Research Centre (BRISK) on priority countries of the Global Facility for Disaster Risk Reduction (GFDRR) of the World Bank provides a possible way for this to be achieved. Their study produced a simple estimate of the risk posed to any one country by combining numerically assigned hazard levels and their related uncertainty levels with population exposure indices for each volcano. Our study applied this methodology to countries in the Lesser Antilles to establish risk levels and assess its usefulness in preparing for the threat of upcoming eruptions.

A database of recorded past eruptions was compiled using data from three sources: Volcanic Hazard Atlas of the Lesser Antilles, Smithsonian Global Volcanism Program and LaMEVE. This data was then used to calculate hazard and uncertainty scores for selected islands using the NGI methodology. Initial results have put into perspective the hazard level of each volcano but have also highlighted possible limitations in applying this methodology to regions with limited data. Scores were found to underestimate hazard levels due to the paucity of recorded eruption together with the disparity in recorded histories for this region. To account for this, future eruption scenarios were used in tandem with past eruption details to determine volcano hazard levels. Population exposure indices were calculated to determine the overall volcanic risk for each island. It is anticipated that further work will help clarify the appropriateness of this method for estimating risk in the Lesser Antilles.