



Probabilistic Hazard Estimation at a Densely Urbanised Area: the Naples Volcanoes

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The Naples volcanic area (Southern Italy), including Vesuvius, Campi Flegrei caldera and Ischia island, is the highest risk one in the World, where more than 2 million people live within about 10 km from an active volcanic vent. Such an extreme risk calls for accurate methodologies aimed to quantify it, in a probabilistic way, considering all the available volcanological information as well as modelling results. In fact, simple hazard maps based on the observation of deposits from past eruptions have the major problem that eruptive history generally samples a very limited number of possible outcomes, thus resulting almost meaningless to get the event probability in the area. This work describes a methodology making the best use (from a Bayesian point of view) of volcanological data and modelling results, to compute probabilistic hazard maps from multi-vent explosive eruptions. The method, which follows an approach recently developed by the same authors for pyroclastic flows hazard, has been here improved and extended to compute also fall-out hazard. The application of the method to the Neapolitan volcanic area, including the densely populated city of Naples, allows, for the first time, to get a global picture of the areal distribution for the main hazards from multi-vent explosive eruptions. From a joint consideration of the hazard contributions from all the three volcanic areas, new insight on the volcanic hazard distribution emerges, which will have strong implications for urban and emergency planning in the area.