



## **Naples between two fires: eruptive scenarios for the next eruptions by an integrated volcanological-probabilistic approach.**

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Probabilistic approaches based on available volcanological data from real eruptions of Campi Flegrei and Somma-Vesuvius, are assembled in a comprehensive assessment of volcanic hazards at the Neapolitan area. This allows to compare the volcanic hazards related to the different types of events, which can be used for evaluating the conditional probability of flows and falls hazard in case of a volcanic crisis. Hazard maps are presented, based on a rather complete set of numerical simulations, produced using field and laboratory data as input parameters relative to a large range (VEI 1 to 5) of fallout and pyroclastic-flow events and their relative occurrence. The results allow us to quantitatively evaluate and compare the hazard related to pyroclastic fallout and density currents (PDCs) at the Neapolitan volcanoes and their surroundings, including the city of Naples. Due to its position between the two volcanic areas, the city of Naples is particularly exposed to volcanic risk from VEI>2 eruptions, as recorded in the local volcanic succession. Because dominant wind directions, the area of Naples is particularly prone to fallout hazard from Campi Flegrei caldera eruptions in the VEI range 2-5. The hazard from PDCs decreases roughly radially with distance from the eruptive vents and is strongly controlled by the topographic heights. Campi Flegrei eruptions are particularly hazardous for Naples, although the Camaldoli and Posillipo hills produce an effective barrier to propagation to the very central part of Naples. PDCs from Vesuvius eruptions with VEI>4 can cover the city of Naples, whereas even VEI>3 eruptions have a moderate fallout hazard there.