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Spatio-temporal occurrence of eruptions in El Hierro (Canary Islands). Sequential steps for long-term volcanic hazard assessment.

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Long term volcanic hazard assessment requires the attainment of several sequential steps, including the compilation of geological and volcanological information, the characterization of past eruptions, spatial and temporal probabilistic studies, and the simulation of different eruptive scenarios to get qualitative and representative results. Volcanic hazard assessment has not been yet systematically conducted in the Canary Islands, in spite of being a densely populated active volcanic region that receives millions of visitors per year. In this paper we focus our attention on El Hierro, the youngest and latest island affected by an eruption in the Canary Islands. We analyze the past eruptive activity (how), the spatial probability (where), and the temporal probability (when) on the island. Looking at the past eruptive behavior of the island, and assuming future eruptive patterns will be similar, we try to identify the most likely set of volcanic scenarios and corresponding hazards that could occur in the future (eg. lava flows, pyroclastic fallout, and pyroclastic density currents) and estimate their probability of occurrence. The final result shows the first volcanic hazard map of the island.
This study represents a step forward in the evaluation of long term volcanic hazard at El Hierro Island with regard to previous studies. The obtained results should represent the main pillars on which to build risk mitigation programs as it is required for territorial planning and to develop emergency plans.

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