

Preface

Edited by Annalisa Cappello¹ and Daniele Morgavi²

⁽¹⁾ Istituto Nazionale di Geofisica e Vulcanologia, Osservatorio Etneo, Catania, Italy

⁽²⁾ Università degli Studi di Napoli Federico II, Dipartimento di Scienze della Terra e dell'Ambiente e delle Risorse, Napoli, Italy

Mitigating the impact of volcanic eruptions and improving the resilience in high-risk communities is increasingly recognized as a significant social priority. The main sources of hazard that can affect volcanic areas are lava flows, pyroclastic density currents, tephra fallouts, ballistic ejecta, lahars, and volcano-tectonic earthquakes. These dangerous events can occur simultaneously or in close proximity in time and space, highlighting the importance to investigate cumulative and/or cascading or interacting hazards and impacts, broadening the perspective to non-volcanic hazards, such as wildfires. To minimize and mitigate the risk associated with volcanic eruptions, it is necessary to evaluate both the hazard and how the society would respond, in the best possible way, to the resulting impacts.

The aim of this Special Issue in Annals of Geophysics is to present a collection of works focused on new strategies to address scientific challenges related to field and petrological analysis, numerical modeling of eruptive processes, quantification of volcanic hazards and multi-hazard, methods of identification and characterization of vulnerable elements, vulnerability and risk assessment in a multi-risk context and how to combine hazard and risk to increase preparedness and implement mitigation measures.

Specifically, the volume includes contributions dedicated to volcanic and seismological monitoring, as well as new approaches for assessing various hazards: volcanic earthquakes, tephra fallout, lava flows, pyroclastic density currents, ballistic projectiles, and fires ignited by volcanic products. Finally, the issue features contributions focused on innovative methodologies and tools for multi-hazard and multi-risk analyses in volcanic areas.