


Active Volcanoes of the World

Pablo J. González *Editor*

El Hierro Island



 Springer

Active Volcanoes of the World

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About 500 active volcanoes presently exist on the Earth's surface, of which around 50 erupt each year. Volcanoes played a crucial role in the evolution of the planet and early life, and are constantly reshaping the morphology of Planet Earth. Many active volcanoes are located in dense settlement areas, with over 500 million people living in close proximity of still active or dormant volcanoes.

On one side, volcanoes provide valuable soil and rock basis for agriculture, but often the "mountains of fire" cause disastrous societal and economical disasters caused by ash clouds, lahars, lava flows, and pyroclastic flows. Eruptions are still difficult to predict, although volcanologists around the world are constantly working on new ways to understand the character and behavior of volcanoes.

Active Volcanoes of the World is an official book series of the International Association of Volcanology and Chemistry of the Earth's Interior (IAVCEI). The series aims to be a scientific library of monographs that provide authoritative and detailed reviews of state-of-the art research on individual volcanoes or a volcanic area that has been active in the last 10.000 years, e.g. the Teide Volcano or the Chiapas Region. The books in the series cover the geology, eruptive history, petrology and geochemistry, volcano monitoring, risk assessment and mitigation, volcano and society, and specific aspects related to the nature of each described volcano.

The Active Volcanoes of the World series contains single and multi-authored books as well as edited volumes. The Series Editors, Dr. Corrado Cimarelli and Dr. Sebastian Müller are currently accepting proposals and a proposal document can be obtained from the Publisher, Dr. Annett Buettner (annett.buettner@springer.com).

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Preface

More than ten years have passed since the landmark 2011–2012 submarine eruption in El Hierro Island. This eruption represented a revolution for the Spanish volcanology. It provided with a real, sometimes unpleasant, testbed of the strengths and weaknesses in the regional volcanic eruption management systems. Almost exactly a decade later, this professional and scientific experience demonstrated to be invaluable, when another eruption, in this case on land, struck the Canary Islands. The 19th of September–13th of December 2021 Tajogaite volcano eruption in La Palma was confronted with a much more organized scientific, emergency and decision-making strategies (e.g., the PEVOLCA legal framework). Nevertheless, the La Palma volcano crisis, including pre-eruptive, eruptive and post-eruption phases, showed also new challenging aspects from which we will learn new lessons for future volcano crises. The successful response in La Palma would have not been possible without the in-depth study of the 2011–2012 El Hierro submarine eruption. The wealth of data collected and analyzed on the wake of the submarine eruption sprung into new knowledge about the behavior of the volcanic system, including the eruption impact in the environment and society. In the summer of 2022, for example, a total of 1930 results can be retrieved when searching for “El Hierro” “eruption” in Google Scholar.

The current book is a necessarily partial and biased tour of the wide knowledge of the eruption and El Hierro as volcanic system. Such information has the benefit of the hindsight and reflection over a meaningful period of time, around a decade of intense research. The scope of the current book is explained by the challenging circumstances of working during a period marked by the COVID-19 global pandemic and the, at the time, ongoing 2021 Tajogaite volcano eruption in La Palma. In fact, in October 2021, a dedicated workshop where discussions among potential book contributors had to be cancelled was planned on the same week that marked the 10th anniversary of the 2011–2012 submarine eruption in El Hierro. Despite these difficulties, the authors submitted contributing chapters, and we could carry out a rigorous peer-reviewed process resulting in the current volume—*El Hierro Island*. The topics in the book are a representative sample of what the volcano science is, knowledge always in progress. I hope that the readership should consider the covered topics as a useful starting point of discussion and opportunities of their own future research.

Last but not least, something I am very proud of editor was promoting gender equality. In fact, a glad surprise was to achieve it on our first round of list of corresponding and leading authors of the book. Such balance between male and female contributors to this book should be interpreted that the Spanish volcano science community is making positive strides. However, we should not be complacent. This is not the end of the road for a fair research environment. Less visible barriers, related with social and cultural diversity, should be considered with the aim to achieve a healthy respectful, diverse, equitable and justice community.

San Cristóbal de La Laguna, Spain

Pablo J. González

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