

## **Tourists' perception of volcanic hazards and volcanic risk in Tenerife Island**

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An effective volcanic risk management is a collective responsibility for all individuals and groups who visit, work and live in areas with volcanic activity. This includes scientists, communication professionals, tourists, urban and territorial planners and the general public. While some may have more specific roles and responsibilities in this endeavor, visitors can make a significant contribution to volcanic risk management efforts.

Tourists and travelers can also help in volcano safety by learning about volcanoes, following safety rules, and evaluating safety measures. This double duty may be tough, but it's essential for transparency and accountability in volcanic risk management.

This research aims to assess the level of understanding and interest that tourists have about volcanoes and volcanic risk management in Spain, and to examine the potential and desired role of the tourists in enhancing the effectiveness of volcanic risk management efforts.

To assess tourists' perceptions of volcanic hazards and risks on Tenerife, we have designed a face-to-face questionnaire. The questionnaire consists of approximately 30 questions and can be completed in about 15 minutes. Approximately 20% of the questionnaire covers demographic data, while questions about volcanoes and volcanic risk management account for roughly 40%, with the remaining 40% centered on respondents' perception of volcanic hazards and risks. The questionnaire was released on July 18 and by the end of September 2023, a total of 419 tourists had completed it. Here we present some preliminary results obtained including qualitative data on needs and sentiment towards volcanic risk.

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**Ten recommendations for volcanic risk communication: lessons learned from a volcanic crisis and communicating high-impact risks.**

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Developing effective communication strategies is essential to ensure we deliver accurate, inclusive, and timely messages in times of crisis. Understanding how best to reach our audiences, how to tailor messaging and language, to choose the right platforms and frequency and, to ensure our approach meets audience requirements are some of the considerations we must make as communicators. So, how can and should we develop risk communication strategies for both, communities, and stakeholders to ensure we are prepared for future volcanic crises? Here, we provide some recommendations for volcanic risk communications, drawn from research evaluating the crisis communication campaign during the 2020-2021 volcanic eruption of La Soufriere, St. Vincent. We also apply lessons from the field of global catastrophic risk studies, sharing insights from communicating high-impact risks, including large-magnitude volcanic eruptions and asteroid impacts. The recommendations cover insights on accessible messaging, appropriate platforms, accounting for inclusivity, embedding culture, fostering trust, and utilising community-centred approaches. We will use examples from fieldwork in St. Vincent and Dominica to share how we have worked to develop risk communication strategies during times of calm, ensuring we are prepared for future volcanic eruptions.

## **Understanding volcano communication needs over time: A case study from Aotearoa New Zealand**

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Volcano communication varies across time, and what is communicated depends on the phase of 'activity' in terms of whether a volcano is in quiescence, unrest, eruption, or post-eruption. Communication is also dependent on other contextual factors such as the nature and style of the volcano in question, the population at risk, the cultural context, and the coordinating agencies or partners involved. We undertook a mixed-methods study investigating volcano communication in New Zealand across time, both in actual and potential situations. The first component of the study involved a literature review to identify past communication for different phases of volcanic activity. The review identified a wealth of communication literature about the quiescence phase followed by the eruption phase, but less so for unrest and post-eruption, and only partial focus on understanding decision-makers' needs. The review was followed by focus groups with the public and stakeholders, to determine what information is needed during different timeframes to aid decision-making. Discussions have shown (not unexpectantly) that levels of concern about volcanic activity increase during eruption phases and continue to stay high post eruption. However, the importance of information remains high throughout all phases (quiescence, unrest, eruption, and post eruption). The topics of information which are considered critical to any stage include information on: what the volcano is doing now and where to get more information should it be needed. Impact information is also highly regarded as critical during eruption phases. These findings will be integrated into GNS Science volcano monitoring group communications.

## **Connecting volcanoes and people: The role of social scientists at New Zealand's volcano observatory**

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Volcanoes are only a cause for concern when they effect people. Ash can affect aviation, agriculture, infrastructure, and human health; near-field hazards cause danger to lives, amongst many other examples. As such, expertise on societal aspects needs to be considered when producing science advice relating to volcanoes. Social scientists often explore the wider context, such as decision-making thresholds, user needs, socio-political situations, and the principles of effective communication.

In Aotearoa New Zealand, the volcanoes are monitored by GNS science through the GeoNet Volcano Monitoring Group (VMG). The VMG comprises multidisciplinary scientists, including social scientists. Social scientists conduct a range of activities relating to volcano monitoring, primarily relating to the provision of science advice. Activities include attending the weekly monitoring meeting and providing advice on 'business as usual' communications, co-producing forecasts and informing website articles, engaging with stakeholders during a response, and conducting longer term reviews of the communication during quiescence. More recently, social scientists have been developing a new spatial data stream based on real-time crowdsourced observations of hazards, impacts, and their responses, informing fieldwork and decision-making.

During the Taupō volcanic unrest episode in 2022-23, GNS Science social scientists contributed through all activities listed above, in addition to the application of historical unrest information to forecasts. Hazard maps were also produced, and communication processes evaluated post-unrest. This presentation will describe the various activities undertaken by social scientists, illustrated using the Taupō example, to contribute towards the mitigation of volcanic hazards to society.

## **Better together: management of the 2018-2019 Peteroa volcano eruptive crisis through the lens of interdiscipline**

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There is a growing consensus on the importance of interdisciplinary approaches in addressing problems related to disaster risk reduction. The present work seeks to show through a case study how the social sciences, in dialogue and interaction with their physical and natural counterparts, result in a key resource to characterize a territory and a community affected by a volcanic eruption and thus obtain information that contributes to the design of effective risk reduction strategies for future volcanic events. The research focuses on the management of the 2018-2019 eruptive crisis of Peteroa volcano in Argentina. Peteroa is one of the most active volcanic systems in the Southern Andes, with recurrent explosive activity over the last centuries. Its surroundings are inhabited by a rural community that practices extensive transhumance livestock farming and that poses a series of vulnerabilities to cope with volcanic hazards. Despite the eruption being small and the low thickness of ash deposited in the area, the associated impacts were not negligible. We combine disciplinary perspectives and tools to recover the testimony and experiences of the farmers and different key actors involved in the crisis management. As an outcome, we identify a series of problems and shortcomings as well as some positive aspects that occurred during the eruptive crisis. Focusing the analysis on 3 central nodes –articulation, assistance, and communication– we highlight some strategic dimensions to manage future eruptive crises and to work on risk reduction during non-eruptive periods.