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'Understanding volcanoes and society: the key for risk mitigation'



Understanding Volcanic Impact: the need to focus on vulnerability

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Key words:

Effective natural hazard risk assessment requires the characterisation of both hazards and vulnerabilities of exposed elements. Volcanic hazard assessment is maturing rapidly and is a considerable focus of volcanic scientific inquiry, whereas comprehensive vulnerability assessment is lacking. Yet vulnerability is a critical component of any useful impact assessment and more broadly to reduce volcanic risk.

Analysis of observations from 'the field' have provided a rich catalogue of potential volcanic impacts which society may experience. Recent empirical, experimental and theoretical studies have greatly improved our understanding of the physical response of elements to volcanic hazards, such as following the 1980 Mt St Helens eruption, 1991 Pinatubo eruption, 2010 Eyjafjallajökull eruption and beyond. However, systematic and comprehensive documentation of observed impacts, including cascading impacts, under a wide range of volcanic hazard conditions is lacking. Quantitative impact studies are required to supplement the sparse existing empirical data set and for calibrating the few existing vulnerability models. Empirical investigation of volcanic impacts in controlled laboratory settings is a promising area of research to address this gap, particularly when informed by field observations.

This presentation will present examples of how integrated field and laboratory based studies have explored physical vulnerability to volcanic hazards issues in New Zealand, with a focus on volcanic ash and volcanic ballistic impacts. It will also outline how this research has contributed to developing associated mitigation measures into volcanic risk management approaches.