



Cities on Volcanoes 9
November 20-25, 2016
Puerto Varas, Chile

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



Volcanic risk assessment and management through the CERG-C international training program at Vulcano Island, Italy

Costanza Bonadonna¹, Sebastien Biass^{1 2}, Chris Gregg^{3 1}, Scira Menoni^{4 1}, Franco Romerio⁵, Corine Frischknecht¹, Mauro Rosi⁶

¹Earth Sciences Dept, Geneva University, CH;

²Geology and Geophysics Dept, University of Hawaii at Manoa, USA;

³Geosciences Dept, East Tennessee State University, USA;

⁴Politecnico of Milano, IT;

⁵Geneva School of Economics and Management, CH;

⁶Earth Sciences Dept, Pisa University, IT

Key words: hazard; vulnerability; risk; impact; Vulcano island; La Fossa volcano

The science of volcanic risk assessment is relatively young in studies of natural hazards. No comprehensive method is widely accepted and, while several models identify some individual aspects of hazard, they lack inclusion of key indicators of both vulnerability and resilience. This obscures our understanding of the real risk we face by natural hazards. Since 1988, the CERG-C post-graduate certificate program of the University of Geneva (<http://www.unige.ch/hazards>) has trained PhD students and practitioners in geological risk assessment and management with a field component for volcanic risk held on Vulcano Island, Italy. Through the CERG-C and ENSURE project funded by the European Commission, we developed a comprehensive framework for the assessment of volcanic risk involving important aspects of hazard; exposure; physical, systemic, social and economic vulnerabilities; and mitigation capacities. In particular, we have characterized the impact of selected hazard scenarios (i.e. tephra fallout and ballistics associated with subPlinian and Vulcanian eruptions); the general population's beliefs and expectations concerning future eruptions; physical vulnerability of the infrastructure and building stock; systemic vulnerability; and the impact of a future eruption on the economic system (i.e., primarily real estate, infrastructure and tourism). Vulnerabilities, as well as risk, should be considered as a dynamic rather than a static concept and while negative impacts in areas of active volcanism arise during and after eruptions, they may also occur in the absence of an eruption during periods of volcanic unrest (e.g., Long Valley, Rabaul). During emergency and recovery phases, various aspects (e.g. systemic, social, institutional, and organizational factors) determine whether or not people and communities can return to a certain degree of normalcy or even develop greater resilience, and if so, under what conditions and timeframe. Managing risk involves understanding various hazards and vulnerabilities, but also capitalizing on the benefits of active volcanism.