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

Four decades after the 1976-1977 eruptive crisis of La Soufrière of Guadeloupe (French West Indies): lessons from a school case of failed risk evaluation and communication by volcano experts.

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Volcanologists in charge of a volcano emergency face the heavy responsibility of providing society with a reliable and timely expertise of hazards from natural phenomena whose evolution and impacts are not always easily predictable. Minimizing the risks inherent to such a responsibility requires that the intrinsic uncertainty in volcanic hazard assessment and the procedures for communicating this uncertainty be clearly pre-established between volcanologists and the society. One famous counter-example of failed risk evaluation and communication by volcano experts occurred just 40 years ago, on occasion of the 1976-1977 eruptive crisis of La Soufrière volcano in Guadeloupe island. This crisis involved pre- and syn-eruptive seismicity (16000 events) and 26 phreatic outbursts associated with fracture opening, mudflows and ash falls, but with emission of only lithic solid material. It provoked a 4-months evacuation of 75000 people from the surrounding areas (one fifth of whole Guadeloupe population), severe economic loss, and a strong public controversy among scientific experts about its actual significance and a possible magmatic issue. This event was the sixth phreatic eruptive crisis of La Soufrière volcano since its last magmatic eruption 450 years ago (pyroclastic flows and lava dome extrusion). In this talk I'll describe the main causes of scientific failures in hazard assessment and communication, their long-lived implications and the lessons drawn from this school case example in which I was personally involved. More broadly, the 1976-1977 eruptive crisis of La Soufrière, together with the 2014 Ontake eruption in Japan, remind us the special difficulties faced by volcanologists in forecasting phreatic eruptions, assessing their actual triggering mechanism and their final issue. Four decades later French volcanologists still debate of the actual trigger of La Soufrière phreatic crisis in 1976-1977 and of its potential significance to interpret a currently ongoing new hydrothermal unrest.