



Preliminary impact assessment of effusive eruptions at Etna volcano

Annalisa Cappello (1), Audrey Michaud-Dubuy (2), Stefano Branca (1), Emanuela De Beni (1), and Ciro Del Negro (1)

(1) Istituto Nazionale di Geofisica e Vulcanologia, Osservatorio Etneo, Catania, Italy (annalisa.cappello@ingv.it), (2) University of Science and Technology, Montpellier II, France

Lava flows are a recurring and widespread form of volcanic activity that threaten people and property around the world. The growing demographic congestion around volcanic structures increases the potential risks and costs that lava flows represent, and leads to a pressing need for faster and more accurate assessment of lava flow impact. To fully evaluate potential effects and losses that an effusive eruption may cause to society, property and environment, it is necessary to consider the hazard, the distribution of the exposed elements at stake and the associated vulnerability. Lava flow hazard assessment is at an advanced state, whereas comprehensive vulnerability assessment is lacking. Cataloguing and analyzing volcanic impacts provide insight on likely societal and physical vulnerabilities during future eruptions. Here we quantify the lava flow impact of two past main effusive eruptions of Etna volcano: the 1669, which is the biggest and destructive flank eruption to have occurred on Etna in historical time, and the 1981, lasting only 6 days, but characterized by an intense eruptive dynamics. Different elements at stake are considered, including population, hospitals, critical facilities, buildings of historic value, industrial infrastructures, gas and electricity networks, railways, roads, footways and finally land use. All these elements were combined with the 1669 and 1981 lava flow fields to quantify the social damage and economic loss.