



MEDiterranean Supersite Volcanoes (MED-SUV) project: from objectives to results

Giuseppe Puglisi, Letizia Spampinato, and the MED-SUV Consortium Team
Istituto Nazionale di Geofisica e Vulcanologia, Sezione di Catania - Osservatorio Etneo, Italy

The MEDiterranean Supersite Volcanoes (MED-SUV) was a FP7 3-year lasting project aimed at improving the assessment of volcanic hazards at two of the most active European volcanic areas - Campi Flegrei/Vesuvius and Mt. Etna. More than 3 million people are exposed to potential hazards in the two areas, and the geographic location of the volcanoes increases the number of people extending the impact to a wider region. MED-SUV worked on the (1) optimisation and integration of the existing and new monitoring systems, (2) understanding of volcanic processes, and on the (3) relationship between the scientific and end-user communities. MED-SUV fully exploited the unique multidisciplinary long-term in-situ datasets available for these volcanoes and integrated them with Earth observations. Technological developments and implemented algorithms allowed better constraint of pre-, sin- and post-eruptive phases. The wide range of styles and intensities of the volcanic phenomena observed at the targeted volcanoes - archetypes of 'closed' and 'open' conduit systems - observed by using the long-term multidisciplinary datasets, exceptionally upgraded the understanding of a variety of geo-hazards. Proper experiments and studies were carried out to advance the understanding of the volcanoes' internal structure and processes, and to recognise signals related to impending unrest/eruptive phases. Indeed, the hazard quantitative assessment benefitted from the outcomes of these studies and from their integration with cutting edge monitoring approaches, thus leading to step-changes in hazard awareness and preparedness, and leveraging the close relationship between scientists, SMEs, and end-users. Among the MED-SUV achievements, we can list the (i) implementation of a data policy compliant with the GEO Open Data Principles for ruling the exploitation and shared use of the project outcomes; (ii) MED-SUV e-infrastructure creation as test bed for designing an interoperable infrastructure to manage different data sources, applying the data policy, and envisaging sustainability strategies after the project in a coherent national and international framework; (iii) improvement of the SAR capability in detecting and monitoring ground deformation; (iv) development/implementation and testing of prototypes and software for measuring and retrieving more accurate/novel parameters; (v) integration of satellite and in-situ data; and (vi) novel methods of data analysis increasing the knowledge of volcanic process dynamics and improving alert systems. The project has fostered the assessment of short-term volcanic hazard in the Italian Supersites, and exploitation of the information provided by the monitoring. The main breakthroughs in the hazard focused on fine-tuning the Bayesian approach for the probabilistic evaluation of the occurrence of eruptive events at Campi Flegrei and its effects in the area, and the preliminary application to assess the occurrence of flank eruptions and the effects of volcanic plume fallout at Mt. Etna. Indeed, MED-SUV worked also on the communication between scientists and decision makers by evaluating the suitability of scientific outcomes (e.g. hazard maps) to be informative for this goal. Dissemination of the outcomes aimed at spreading new volcanology knowledge among the scientific community, as well as among decision-maker bodies and public, and allowing the end-user community access to the two Italian Supersites' data through a properly implemented e-infrastructure.