



Strategies for the implementation of a European Volcano Observations Research Infrastructure

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Active volcanic areas in Europe constitute a direct threat to millions of people on both the continent and adjacent islands. Furthermore, eruptions of “European” volcanoes in overseas territories, such as in the West Indies, an in the Indian and Pacific oceans, can have a much broader impacts, outside Europe. Volcano Observatories (VO), which undertake volcano monitoring under governmental mandate and Volcanological Research Institutions (VRI; such as university departments, laboratories, etc.) manage networks on European volcanoes consisting of thousands of stations or sites where volcanological parameters are either continuously or periodically measured. These sites are equipped with instruments for geophysical (seismic, geodetic, gravimetric, electromagnetic), geochemical (volcanic plumes, fumaroles, groundwater, rivers, soils), environmental observations (e.g. meteorological and air quality parameters), including prototype deployment. VOs and VRIs also operate laboratories for sample analysis (rocks, gases, isotopes, etc.), near-real time analysis of space-borne data (SAR, thermal imagery, SO₂ and ash), as well as high-performance computing centres; all providing high-quality information on the current status of European volcanoes and the geodynamic background of the surrounding areas.

This large and high-quality deployment of monitoring systems, focused on a specific geophysical target (volcanoes), together with the wide volcanological phenomena of European volcanoes (which cover all the known volcano types) represent a unique opportunity to fundamentally improve the knowledge base of volcano behaviour. The existing arrangement of national infrastructures (i.e. VO and VRI) appears to be too fragmented to be considered as a unique distributed infrastructure. Therefore, the main effort planned in the framework of the EPOS-PP proposal is focused on the creation of services aimed at providing an improved and more efficient access to the volcanological facilities and observations on active volcanoes. The issue to facilitate the access to this valued source of information is to reshape this fragmented community into a unique infrastructure concerning common technical solutions and data policies. Some of the key actions include the implementation of virtual accesses to geophysical, geochemical, volcanological and environmental raw data and metadata, multidisciplinary volcanic and hazard products, tools for modelling volcanic processes, and transnational access to facilities of volcano observatories. Indeed this implementation will start from the outcomes of the two EC-FP7 projects, Futurevolc and MED-SUV, relevant to three out of four global volcanic Supersites, which are located in Europe and managed by European institutions. This approach will ease the exchange and collaboration among the European volcano community, thus allowing better understanding of the volcanic processes occurring at European volcanoes considered worldwide as natural laboratories.