GlobVolcano: Earth Observation Services for global monitoring of active volcanoes

L. Tampellini (1), R. Ratti (1), S. Borgström (2), F. M. Seifert (3), and G. Solaro (2)

(1) Carlo Gavazzi Space S.p.A, 20151 Milano Via Gallarate 150, Italy (ltampellini@cgpsace.it / +39 02 38086458), (2) Istituto Nazionale di Geofisica e Vulcanologia - Osservatorio Vesuviano, 80124 Naples Via Diocleziano 328, Italy (sven@ov.ingv.it / +39 081 61.00.811), (3) European Space Agency - ESRIN, 00044 Frascati (Roma) Via Galileo Galilei, 64, Italy

The GlobVolcano project is part of the Data User Element (DUE) programme of the European Space Agency (ESA).

The objective of the project is to demonstrate EO-based (Earth Observation) services able to support the Volcanological Observatories and other mandate users (Civil Protection, scientific communities of volcanoes) in their monitoring activities. The information service is assessed in close cooperation with the user organizations for different types of active volcano, from various geographical areas in various climatic zones.

Users are directly and actively involved in the validation of the Earth Observation products, by comparing them with ground data available at each site.

The following EO-based information services have been defined, harmonising the user requirements provided by a worldwide selection of user organizations.

- Deformation Mapping
- Surface Thermal Anomalies
- Volcanic Gas Emission (SO2)
- Volcanic Ash Tracking

During the first phase of the project (completed in June 2008) a pre-operational information system has been designed, implemented and validated, involving a limited number of test areas and respective user organizations (i.e. Piton de la Fournaise in La Reunion Island, Karthala in Comore Islands, Stromboli, Volcano and Etna in Italy, Soufrière Hills in Montserrat Island, Colima in Mexico, Merapi in Indonesia).

The second phase of the project (currently on-going) concerns the service provision on pre-operational basis. Fifteen volcanic sites located in four continents are regularly monitored and as many user organizations are involved and cooperating with the project team.

Based on user requirements, the GlobVolcano Information System has been developed following system engineering rules and criteria, besides most recent interoperability standards for geospatial data. The GlobVolcano Information System includes two main elements:

1. The GlobVolcano Data Processing System, which consists of seven of EO data processing subsystems located at each respective service centre.

2. The GlobVolcano Information Service, which is the provision infrastructure, including three elements:

- GlobVolcano Products Archives, including two main functionalities: WMS (Web Map Service) for products visualization through the GVUI and products delivery.
- GlobVolcano Metadata Catalogue, offering CS-W (Catalogue Service for Web) functionality.
- GlobVolcano User Interface (GVUI), based on the Virtual Earth platform.

Whereas product downloading is allowed to committed user organisations only, the Metadata Catalogue can be publicly accessed, thus providing a powerful tool for scientific interchanges and cooperation among the user organizations and scientific communities of volcanoes.