Volcano Monitoring using Earth Observing Satellites – CEOS WG Disasters Volcano Pilot

Priority for Action 1: “Understanding Disaster Risk”
Priority for Action 4: “Enhancing disaster preparedness for effective response”

Application field: About 1500 volcanoes worldwide are known to have erupted in the last 12,000 years. Yearly, ca. 50 of them have observable eruptions. It is estimated that less than 10% of active volcanoes are monitored on an on-going basis. Modern space-borne radar satellites provide recognized techniques for the early detection of possible magma injections, for monitoring the stability of volcanoes, and for creating 3D digital elevation models anywhere on Earth. Such techniques provide key information for identifying volcanic hazards and assessing associated risks.

The Volcano Pilot activity of the CEOS Disasters Working Group in which volcanologists, remote sensing specialists, and Space agencies work together pursues the following aims:

a. Demonstrate the utility of integrated, systematic space-based EO as a volcano monitoring tool on a regional basis and for specific case studies;
b. Provide space-based EO products to the existing operational community (such as volcano observatories and VAACs) that can be used for better understanding volcanic activity and reducing impact and risk from eruptions;
c. Build the capacity for use of EO data at the majority of the world’s volcanoes (particularly those that are not monitored by other means).

Key results:
- Identification of volcanoes that are in a state of unrest in Latin America;
- Demonstration of the feasibility of operational volcanic monitoring using satellite-based EO;
- Tracking of unrest / eruptive activity using satellite data in support of hazards mitigation;
- Validation of EO-based methodology for improved monitoring of surface deformation;
- Improved EO-based monitoring of key parameters for volcanoes;
- Capacity-building in countries that do not currently have access to abundant EO data and/or the ability to process and interpret such data.

Innovative impact: The activity is ongoing. Noteworthy results have been yielded for numerous volcanoes. In all cases, these results were either achieved collaboratively with, or communicated to, local scientists and stakeholders. Feedback from several local stakeholders confirms the relevance of these results to local decision-making.

References:

http://ceos.org/ourwork/workinggroups/disasters/ Contact: Jens.Danzeglocke[at]dlr.de