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Surveillance of Peruvian active volcanoes (invited)

O. Macedo
Instituto Geofísico del Perú, Peru

Subduction of the oceanic Nazca Plate beneath the western of the continental South American plate is at the origin of the three main zones of active volcanism in the Andean plate margin: the NVZ, CVZ and SVZ (Northern, Central and Southern Volcanic Zone, respectively). Peruvian active volcanoes are situated on the northern part of CVZ between 15° and 18° south latitude, and ten of them are the most active: Sara Sara, Coropuna, Sabancaya, Misti, Ubinas, Huaynaputina, Ticsani, Tutupaca, Yucamane and Casiri.

Since the last 600 years there were some 40 eruptions produced by the ten most active volcanoes of Peru, which represents one volcanic crisis each 15 years. Some of these eruptions are cataloged like big eruptions, as for example the Huaynaputina eruption (VEI 6) occurred on February 1600 whose catastrophic effects caused damages over a great part of southern Peru.

Despite this ancient history about the volcanic activity, the development of the volcanology in Peru is relatively recent, and it begun with the occasion of the advent of eruptions of the Sabancaya volcano on 1986, and Ubinas volcano on 2006. It is only after this volcanic crisis that there were made several temporal monitoring of geophysical (seismicity, electromagnetism, electric potential, deformation) and geochemical (anion and cation determination, temperature, pH, in thermal springs; CO and CO_2 in fumaroles) parameters on several volcanoes in Peru. At the present, the main method of surveillance employed on these volcanoes is seismic monitoring. Since October 2005 two volcanoes considered of high risk, the Misti and the Ubinas volcanoes, are monitored by seismic networks which provides real-time data to the Arequipa Volcano Observatory.

In addition to this seismic monitoring, other geophysical and geochemical data or information are currently used. At the last eruption of Ubinas volcano, the collected data allowed to prepare reports and to advise regional authorities in regard to the management of the volcanic crisis and the implementation of contingency plans.

A new Project for monitoring of the whole chain of active volcanoes in Peru had been recently submitted to the Peruvian civil protection authorities. This will be implemented on 2014. So, it will be possible to dispose of seismic data in real time from all the Peruvian volcanoes, and also this Project will permit the purchase of diverse geophysical and geochemical instruments for temporal surveys.