



Lessons learned from the CEOS Volcano Pilot in Latin American and the ongoing Volcano Demonstrator project

Francisco Delgado (1), Michael Poland (2), Juliet Biggs (3), Susanna Ebmeier (4), Eugenio Sansosti (5), Paul Lundgren (6), Christelle Wauthier (7), Scott Henderson (8), Matthew Pritchard (9), Falk Amelung (10), and Simona Zoffoli (11)

(1) Équipe de Tectonique et Mécanique de la Lithosphère, Institut de Physique du Globe de Paris, Paris, France (delgado@ipgp.fr), (2) Cascades Volcano Observatory, United States Geological Survey, Vancouver, WA, United States (mpoland@usgs.gov), (3) University of Bristol, Bristol, United Kingdom (Juliet.Biggs@bristol.ac.uk), (4) University of Leeds, Leeds, United Kingdom (S.K.Ebmeier@leeds.ac.uk), (5) Istituto Per Il Rilevamento Elettromagnetico Dell' Ambiente, Napoli, Italia (eugenio.sansosti@cnr.it), (6) Jet Propulsion Laboratory, NASA/Caltech, Pasadena, CA, United States (Paul.R.Lundgren@jpl.nasa.gov), (7) Pennsylvania State University, State College, PA, United States (cuw25@psu.edu), (8) University of Washington, Seattle, WA (scottyh@uw.edu), (9) Cornell University, Ithaca, NY, United States (pritchard@cornell.edu), (10) University of Miami, Miami, FL, United States (famelung@rsmas.miami.edu), (11) Agenzia Spaziale Italiana, Roma, Italia (simona.zoffoli@asi.it)

Hazards from volcanic eruptions pose risks to the lives and livelihood of local populations, with potential global impacts to businesses, agriculture, and air travel. The 2015 Global Assessment of Risk report notes that ~800 million people are estimated to live within 100 km of ~1400 subaerial volcanoes identified as having eruption potential. However, only 55% of these volcanoes have any type of ground-based monitoring. The only methods currently available to monitor these unmonitored volcanoes are space-based systems that provide a global view. To address this challenge, the 2012 "Santorini report" from the "International Forum on Satellite EO and Geohazards" suggested an integrated, international, global remote sensing geohazards monitoring effort for disaster risk management (Bally et al., 2012) that could leverage the constellation of 20 or more satellites that can observe volcanoes to measure changes in morphology, deformation, degassing and temperature. To realize the vision of the Santorini Report, the Committee on Earth Observing Satellites (CEOS) developed a 4-year pilot project (2013-2017) to demonstrate how satellite observations can be used to monitor large numbers of volcanoes cost-effectively, particularly in areas with scarce instrumentation and/or difficult access. One component of the CEOS volcano pilot was to systematically observe the ~320 Holocene active volcanoes within Latin America with the goal to link the volcano observatories that are governmentally responsible for volcano monitoring with data providers at the international space agencies (ESA, CSA, ASI, DLR, JAXA, NASA, CNES) and remote sensing experts who analyze the data. Here we highlight several case studies where CEOS data have successfully been used by volcano observatories to monitor volcanoes and respond to crises. InSAR and other remote sensing data have served as an independent check on ground sensors, guided the deployment of new instruments, and ultimately provided input to help local authorities determine appropriate alert levels. We describe several lessons learned about the type of data products and information that are most needed by the volcano observatories in different countries. Starting in 2018, CEOS has developed the 3-year Volcano Demonstrator project with new goals that will expand the target volcanoes with high risk and the greatest need for remote sensing in Latin America, Southeast Asia, and Africa — encompassing about half of the world's potentially active subaerial volcanoes. One goal of including more regions is to understand the heterogenous needs of volcano observatories around the world given their diverse capabilities as well as volcanoes with different manifestations of activity and environmental conditions. We will present results from the first year of the Demonstrator.