Geophysical Research Abstracts
Vol. 19, EGU2017-2246, 2017
EGU General Assembly 2017

The Hawai‘i Supersite: A Success Story for Science and Society

Michael Poland

U.S. Geological Survey, Cascades Volcano Observatory, Vancouver, United States (mpoland@usgs.gov)

In 2008, the Hawai‘i Supersite was established to encourage collaborative research into volcanic processes on the Island of Hawai‘i and to aid with the assessment and mitigation of volcanic hazards to the local population. Made permanent in 2012, the Supersite hosts a diverse array of data. Comprehensive ground-based monitoring, conducted by the Hawaiian Volcano Observatory and collaborators, consists of deformation, seismic, gravity, gas emissions, camera observations, and geochemical analyses. Space-based data include over 3500 Synthetic Aperture Radar (SAR) images provided by numerous national space agencies. Using these and other datasets, a variety of insights have been gained into how Hawaiian volcanoes work. For example, magma supply to Kīlauea appears to fluctuate on timescales of just a few years and has a direct impact on eruptive activity. Magma accumulation at Kīlauea was found to promote slip on nearby faults, triggering M4+ earthquakes. Magma storage and transport pathways were mapped at both Kīlauea and Mauna Loa volcanoes, providing a basis upon which to interpret past, present, and future monitoring data. In addition, Supersite data, particularly SAR, have been invaluable for operational monitoring of deformation and lava flow emplacement—critical information for understanding the evolving nature of volcanic hazards in Hawai‘i. The wealth of available data also has facilitated the development of new methodologies for processing and analyzing SAR data, given the large number of images, availability of ground-based data for calibration/validation, and continuous volcanic activity against which to test new methods.

Nine years into the operation of the Hawai‘i Supersite, a long list of published research details the success of the initiative; however, a number of challenges remain. First and foremost, there is little coordination of efforts between Supersite scientists, which will stymie the expansion of research efforts in an era of shrinking resources. In addition, synergistic exploitation of Supersite data is still in a nascent stage. For example, SAR and other thermal/visual data acquired from space are rarely used in combination to better understand volcanic processes. Finally, resource management is difficult without specific funding to support the operation of the Supersite. Support for continuation of the Supersite is a worthy cause, however, because the challenges are minimal compared to the weight and accumulated impact of the existing work. Insights from Supersite data have become invaluable to stakeholders on the Island of Hawai‘i, and results provide exceptional fodder for scientific exploration into how volcanoes work. Future research will open new avenues for investigating Hawaiian volcanism, as well as how the complementary nature of space-, air-, and ground-based datasets can be optimized to provide insights into assessing, forecasting, and mitigating volcanic hazards in Hawai‘i and around the world.