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| **Pilot Name:** Volcano **Objective or sub-objective:** A (Latin America) |
| **February 2015** | **PI or PoC**: M. Poland, S. Zoffoli, J. Biggs, M. Pritchard, E. Sansosti, M. Pavolonis | **Collaborating organisations**: USGS, ASI, University of Bristol, Cornell University, NOAA, and CNR/IREA |
| **Achievements:** • Wrote 3 successful (separate) proposals for SAR data access to DLR, ASI, and CSA/MDA. Data are now being received from each of these space agencies. These data are being used to achieve the goals of objective A (regional monitoring of volcanic arcs in Latin America).• Processed new and archived SAR data and documented previously unpublished ground deformation at several volcanoes in Latin America, including Llaima (Chile), Cordón Caulle (Chile), Planchón-Peteroa (Argentina/Chile), Tungarahua (Ecuador), and Reventador (Ecuador). Results were communicated to CEOS, space agencies, volcano observatories in Colombia, Ecuador, Chile and Peru, and at scientific conferences. |
| **Activities**: The goal of this part of the pilot is to survey all 265 Holocene-age volcanoes in Latin America quarterly and another 50 known to be erupting or deforming to monitor more frequently (monthly, if possible). Much of the work is being completed by graduate students, one each at the University of Bristol (U.K.) and Cornell University (USA).We downloaded the first data for the pilot in August, 2014 from RSAT2 and circulated preliminary analysis revealing new ground deformation at Cordón Caulle (Chile) in September 2014. Additional results from other volcanoes in South America followed quickly. These results have been presented widely by CEOS and at scientific conferences, and have been communicated to local volcano observatories for use in hazards assessment and mitigation. The first data from CSK arrived in September 2014, and from TSX in November 2014. Results from those data have been similarly useful and widely shared. |
| **Data accessed this Q** (#images /satellite):As this is the first report, please see column to the right. | **Total data accessed to date** (#images /satellite):RSAT2: used 100 out of 100 allocated TSX: used about 10 of 400 allocatedCSK: used about 100 out of 200/year allocation  |
| **Products** (delivered this quarter): Interferograms and models of earthquake and magmatic deformation | **User** (by product):IG-EPN Ecuador; SGC Colombia; OVSICORI, Costa Rica; IPG, Peru; Sernageomin, Chile [all users received all products] | **User or practitioner endorsement/opinion/outcomes**None so far, but we have not yet solicited user endorsement. |
| **List any publications directly stemming from pilot work**:**Utility of regional satellite volcano deformation monitoring in Latin America: The CEOS pilot project.** *Delgado, Francisco; Pritchard, Matthew E.; Arnold, David; Biggs, Juliet; Fall Meeting of the American Geophysical Union, 2014, abstract V41C-4830.***Volcano Monitoring on a Regional Scale: Results from the CEOS DRM Volcano Pilot.** *Arnold, David; Biggs, Juliet; Delgado, Francisco; Pritchard, Matthew E.; Ebmeier, Susanna K., FRINGE workshop, Frascati, Italy, March 2015.***Fernandina Volcano (Galápagos) ground deformation modeling via multi-orbits DInSAR data**. *De Novellis V.; Pepe S., Castaldo R.; De Luca C.; Casu F.; Tizzani P.; Sansosti E.*, *FRINGE workshop, Frascati, Italy, March 2015.***Reducing Vulnerability from Latin American Volcanoes Through Enhanced Monitoring Efforts.** *Biggs, J.; Delgado, F.; Arnold, D.; Ebmeier, S.; Pritchard, M.,* International Symposium on the Remote Sensing of the Environment [ISRSE36-278](http://meetingorganizer.copernicus.org/ISRSE36/ISRSE36-278.pdf), Berlin, May 2015. |
| **List objective milestones and state progress to date (%)**2014: Begin studies at site-specific volcanoes of opportunity. Begin collection of data over Latin America and development of derived products. Establish ties with users in Latin America and work with them to define procedures for delivering products. (100%)2015: Provide derived products to appropriate users in Latin America (e.g., VAACs, Observatories) and agencies working on site-specific volcanoes. Collect feedback from users about the data and derived products, and use the feedback to refine monitoring strategies. Provide initial evaluation of pilot results to the World Conference on Disaster Risk Reduction. (20% -- derived products given to end-users in Latin America and some initial feedback received)2016: Receive reports from Latin American users on derived products and adjust as needed. Evaluate results from site-specific studies. Develop broader space-based EO strategy using insights from pilot in a formal report. (0%) |
| **Issues identified and risk management approach**:• We appreciate the support of the space agencies, but it is clear that our current data allocations are not sufficient to monitor all of the volcanoes of interest.  In addition to asking for quota increases, we hope to coordinate CEOS efforts with a few researchers who have independent projects monitoring selected volcanoes to avoid redundant studies -- for example, GFZ (Potsdam, Germany) is working at Lascar (Chile) and Colima (Mexico), and JPL is looking at several volcanoes in Latin America. Further, the supersite observation plan is 50 scenes/year from RSAT2: 25/year at Cotopaxi and 25/year at Tungurahua (both in Ecuador). A stronger tie is needed between the Ecuadorian volcanoes Supersite and the pilot project (thus far, only informal ties are in place).• In addition to the data limits, we are also limited in the workforce.  Considering we just have 1 graduate student at Bristol and 1 at Cornell, it is difficult to keep up with coordinating the satellite observations, processing the data, and communicating with the volcano observatories.  Therefore, we would like to propose the addition of a few researchers to the pilot project to focus on areas where we have not had time to investigate in detail: specifically Mexico, Nicaragua, Guatemala, and El Salvador. We would like to propose specific requirements for adding people to the project: 1) Contribute to project definitions and proposals as required by pilot leads and to the allocation of quota products between members. Take responsibility for a given geographical area and undertake the following tasks: 2)   Coordinate acquisition requests with pilot leads and space agency representatives. 3)   Maintain communication with end users to advise on required changes to the acquisition strategy (e.g. during periods of unrest or volcanic crises). 4)   Provide end-users with up-to-date preliminary results (e.g. processed interferograms) and assist with interpretation as required. 5)   Engage in capacity building and training activities with end users. 6)   Encourage end-user personnel to be lead- or co-authors on peer-reviewed publications as appropriate. 7)   Provide reporting information and images when requested by pilot leads (no more than once per month).     8)   Present results on behalf of the Pilot at scientific conferences (within a rotational scheme).• A goal for the upcoming year is to better coordinate the deformation observations (described above) and thermal observations. |