in a shallow magma chamber. This convection may drive high-background-rate LP seismicity observed at many quiescently active volcanoes, and may also result in surface deformation and high levels of volcanic gas emissions. Periodic fresh inputs of magma into the chamber may initiate an eruption. Several Nicaraguan volcanoes, including Telica, San Cristobal, Masaya and Momotombo, exhibit quiescent activity. Telica has had numerous historical eruptions, the most recent and notable of which was in December 1999 (VEI 2), and exhibits a high background level of activity with frequent explosions and a high rate of LP events. Telica is representative of many quiescently active volcanoes and is a good laboratory for the study of quiescent volcanism and high-background rate seismicity due to its level of activity and also due to ease of access to the volcano. In March 2010 researchers from University of South Florida (USA), The Pennsylvania State University (USA) and INETER (Nicaragua) installed a spatially dense network consisting of six broadband seismometers and eight high rate continuous GPS stations on Telica. These instruments will be deployed for three years to allow observation and analysis of multiple phases of quiescent activity. The results of this study will form the basis for a detailed model of quiescent volcanic processes, which will be applicable to other similarly active volcanoes worldwide to identify meaningful changes in behaviour and provide improvements to eruption forecasts.

1.1-P-80

Inner Structure of the Aso Caldera: Interpretations for Intracaldera Pyroclastic Flow Deposits

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Aso is largest caldera volcano in southwest Japan, erupted large-scale pyroclastic flows four times, Aso-1 (270 ka), Aso-2 (140 ka), Aso-3 (120 ka) and Aso-4 (90 ka). The Aso-4 pyroclastic flow, largest eruption (>600 km3) in Aso, forms present caldera (25 x 16 km). The Aso caldera was considered to have a funnel-shaped structure from gravity anomalies. But recent precise analysis of gravity anomalies of the caldera suggest that the gravity low has steep gradient inside the caldera rim and relatively flat bottom in central area (Komazawa, 1995).

We made precise observations from core samples of geothermal wells. The core samples were divided into five units. Lower breccia (200+m), welded tuff (200m), upper breccia (200m, with lake deposits) and volcanics of central cones (800m), in ascending order. The welded tuff is correlated to the Aso-4 pyroclastic flow from mineral assemblage and chemical composition. The lower breccia and the upper breccia are considered lithic-rich part of the pyroclastic flows. The lower breccia is intercalated with debris avalanche deposits composed of caldera wall rocks. The core stratigraphy and the gravity anomaly show that the caldera has a piston-cylinder type structure rather than a funnel-shaped structure.

1.1-P-81

The Late Holocene Collapse of Antuco Volcano: a Valley Confined Debris Avalanche Flow, Southern Andes, Chile

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Antuco volcano is located in the Southern Andes volcanic Zone, ca. 650 km south from Santiago. Its almost conically shaped edifice fills partially a volcanic depression within the remnants of the older Sierra Velluda volcano. At ca. 4.000 years BP (uncalibrated C^{14} dates on paeleosoil horizons, both within and on top of the avalanche deposit) the ancestral edifice of Antuco volcano partially collapsed towards the NW generating a debris avalanche flow. The flow, initially directed towards the NW, encountered a high topographic barrier foemed by glaciated basement rocks and pre-Antuco volcaniclastic rocks, and diverted towards the W, following the original drainage of the Laja River valley. Once in the fluvial valley, the avalanche flowed down without any secondary diversion for ca. 8 km when it finally stopped. The deposit shows the typical hummocky surface of debris avalanches, and is constituted mainly by volcanic rocks with different degrees of brecciation. Proximal and medial facies show in some places original internal stratigraphy of a paleovolcanic edifice partially preserved, as well as evidences of incorporation of material from the underlying sedimentary units on top of which the flow moved down. The partial collapse dammed temporarily the Laja River, increasing the water level of the Laja Lake. Research funded by Fondecyt project 1070162.

1.1-P-82

Geochemical Evidences that Unrest at Campi Flegrei Resurgent Caldera (Southern Italy) Is Due to Magma Emplacement and Degassing at Shallow Depth Plus Fluxing from a Deep-Seated Regional Body

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Volcanic calderas are affected by unrest episodes usually dominated by hybrid magmatic-hydrothermal system dynamics. Unrest episodes can evolve to eruptions of variable intensity, up to Plinian. Campi Flegrei caldera (CFc) is a type-location for this kind of activity escalation. CFc offers unique opportunity to join volcanological information to a long record of geochemical parameters. This allows understanding the role that magmatic system plays on variations displayed by the hydrothermal system. We model uneruptive unrest episodes as driven by *i*) the shallow emplacement (~4 km depth) of one volatile-rich magma batch ascending from a deep (≥ 8 km) magmatic body of regional extent, *ii*) subsequent gas separation with degassing driven by crystallization and *iii*) fluxing from the deep magmatic body. Our model matches three decades of geochemical constraints from fumarole discharges, as well as data from melt inclusions of past CFc eruptions. Besides, magma physical properties demanded for modeled degassing conditions are in good agreement with existing geophysical data. Our results open new perspectives to the definition of unrest scenarios at highly-populated CFc, as well as other resurgent calderas (e.g., Orsi et al., This Assembly).

1.1-P-83

Historical Basaltic Pyroclastic Flows on São Jorge Island (Azores): A High Volcanic Risk

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Pyroclastic flows are highly hazardous because of their devastating impacts on people and the environment around volcanoes. Most commonly, pyroclastic flows involve andesitic or dacitic lava and are associated with eruption-column collapses or failures of active, unstable lava domes (e.g., at Merapi, Colima, Mt. Pelée, Unzen, and Mt. St. Helens). However, basaltic pyroclastic flows are much more rare but have occurred (e.g., Aso, Fuji, Etna, Ulawun). For the Azores archipelago, two historical eruptions on São Jorge Island (1580 and 1808 A.D.) apparently produced nuées ardentes of basaltic composition, which killed about fifteen persons in 1580 A.D. and more than 30 in 1808 A.D. Historical accounts indicate that precursory earthquake activity preceded and accompanied both eruptions, which consisted of highly explosive phases alternating with brief effusive episodes. The most explosive events, of phreatomagmatic origin, generated basaltic pyroclastic flows. The 1580 A.D. eruption was described by the local people as "a terrible cloud that burn as fire" and also a glowing cloud that contained "globes of flame." The 1808 eruption was described as a "fire typhoon that rose, making a frightful and glowing cloud." Such descriptions in the chronicles are best interpreted as occurrences of pyroclastic flows. Unfortunately, because of intense weathering and agricultural disturbance, these historical pyroclastic deposits are not well preserved in the geologic record. However, prehistoric surges and block-and-ash flows with ^{14}C datable charcoal (e.g., 2,880±60 BP) are recognized at several sites on São Jorge Island, demonstrating that repeated phreatomagmatic eruptions have occurred repeatedly in the geologic past. Thus, there exists a high probability of the recurrence of basaltic pyroclastic flows during some future eruption. Given the very steep slopes of this narrow, linear island and the very close proximity of populated areas to young volcanic centers, such flows would pose severe volcanic hazards.

1.1-P-84

Tenerife's Volcanic Tremor Signals Driven by Strong Atmospheric Pressure Changes?

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A seismic swarm in April 2004 was the first documented volcanic reawakening in Tenerife Island since the last eruption in 1909. During the following months and until mid 2005 there was an increased in CO2 diffused emission and onshore earthquakes, some of them felt. LP events and long duration periods of volcanic tremor were also reported. It's been proposed by different authors that a deep injection of a small batch of magma that did not end in a volcanic eruption, followed by migration of hydrothermal fluids, could be the cause of the volcanic unrest. Since then, sporadic volcanic tremor signals are recorded in CCAN, a IGN seismic monitoring station situated in Las Cañadas, but the lack of onshore seismicity suggests a different origin. After evaluating and analyzing the barometric pressure record of an ACANMET meteorological station (La Laguna-475 m); atmospheric sounding data; NCEP reanalysis charts; CO2 diffuse emission graphs from TFE01, a ITER geochemical station at the summit cone of Teide volcano; and seismograms and spectrograms records from CCAN, we propose that sporadic volcanic tremor signals are owed to great barometric pressure variations that could being showing a different scenery in Tenerife island volcanic system.

1.1-P-85

Structural Lineaments Inferred from Remote Sensing: An Application to Geological Mapping and Landslide Susceptibility Evaluation in the Island of Santiago

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The remote sensing data (optical and radar) was used with the purpose of identify the structural lineaments that crosscut the geological formations that composed the bedrock of the Santiago island (Cape Verde). Besides tectonics, this study also provided new insights to the evaluation of possible areas of landslide instability. The Cape Verde archipelago, located in the Atlantic Ocean some 500–800 km off the coast of Senegal. Hotspot activity around 19–20Ma or, alternatively, around 21–22Ma resulted in a large crustal feature rising 2 km above the oceanic floor, the so-called Cape Verde Rise, on which the Cape Verde Islands are situated. Santiago is an NNW-SSE elongated Island. The volcanic stratigraphy includes: (1) an older Volcanic Complex associated to proto-insular and submarine volcanism and (2) a sequence of volcanic formations and complexes dominated by subaerial volcanic events.

With the purpose of recognizing the structural lineaments and to contribute for a better understanding of the genesis and evolution of this island, remote sensing techniques were applied to data from sensors operating in the optical spectrum (ASTER). The studied image, level 1B, collected during the dry season (02-04-03), was geometrically corrected on the basis of the avail-