

Scientists Install Seismic Sensors in Galapagos to Generate First 3-D Images of a Hotspot Magma Plumbing System

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(PhysOrg.com) -- A team of geologists led by Cindy Ebinger of the University of Rochester have deployed 16 seismic sensors on one of the Galapagos Islands to study the processes of ocean island formation -- particularly those that occur right above mantle "hotspots."

The data Ebinger's team will gather will be used to create the first three-dimensional images of the entire [magma](#) system that gives rise to a volcanic island.

"We just installed 16 seismometers around the Sierra Negra and Cerro Azul volcanoes on Isabela Island," says Ebinger, professor of Earth sciences. "These are the most rapidly deforming volcanoes in the world, so we think we've got a tremendous opportunity to learn about the volcano plumbing systems that create and these islands."

Ebinger and the team that included scientists from the University of Miami, the University of Idaho, Moscow, and the Instituto Geofisco, Escuela Politecnica, Ecuador, buried seismometers along the coastline of Isabela Island, as well as around and in the volcanic crater of Sierra Negra itself. The seismometers will measure earthquakes beneath the islands, as well as distant earthquakes, enabling the team to create images of magma and its movement through the earth's crust.

In addition to the geology team, Lisa Hjelm, a science teacher from the

Girls' Middle School in Mountain View, Calif., participated in the three-week expedition to the Galapagos. Hjelm will use the field experience and data from the study to create educational tools to teach teens about hot spots and volcanism. She blogged about her experiences on the expedition at sierranegragalapagos.blogspot.com.

Sierra Negra erupted in 1979 in what was one of the largest volcanic eruptions in the world in the last 100 years. The volcano's crater swelled and dropped 15 feet in a single day during its last eruption in 2005.

The members of the team will combine their results with satellite-based studies of volcano shape changes and magma chemistry to determine the shape and depth of the magma storage chambers beneath Sierra Negra, and the time periods for magma refilling. Ebinger says the team's studies of magma movement beneath the Galapagos volcanoes has major implications for hazard mitigation on other heavily populated volcanic islands, like Hawaii and the Azores.

The team consists of Falk Amelung, associate professor of marine geology and geophysics at the University of Miami's Rosenstiel School of Marine and Atmospheric Science; Mario Ruiz of the Instituto Geofísico, Escuela Politécnica Nacional de Quito; volcanologist Dennis Geist of the University of Idaho at Moscow, Escuela Politécnica Nacional undergraduate geology student Daniel Pacheco, and Program for Array Seismic Studies of the Continental Lithosphere engineer Eliana Arias-Dotson. Rochester graduate student Dustin Coté joins the team for January data downloads.

Provided by University of Rochester ([news](#) : [web](#))

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