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## **Volcanological and Biological Observatory at Arenal Volcano (Alajuela Province, Costa Rica)**

Arenal Volcano has been Costa Rica's most explosive volcano over the past 4000 years, with at least nine cataclysmic eruptions. It is interesting to geologists because it is located between two other groups of volcanos, it is relatively young (*ca.* 4000 yr), and because, after a 400-year period of repose, it has been erupting continuously for over 20 years. It is interesting to botanists and ecologists because lava flows of various ages are in close proximity, including flows 400 years old and older. These flows quite often have equivalent rainfall and chemical makeup so that differences in flora are most likely the result of age. In addition, the tephra areas in the 1968 devastated zone have scattered pockets of vegetation with different dominant species. Elsewhere on the slopes are large areas of undisturbed premontane wet forest, and one such area stretches 21 km across rugged topography. W. G. Melson and Rodrigo Saenz (Universidad Nacional, Heredia) have been studying Arenal over the past 20 years and have gathered data on the ages of both recent and prehistoric deposits. These data have been recently augmented by many other geologists, and preliminary maps on the ages of the flows are available.

The climate at Arenal is extremely wet, with over 5000 mm of annual rainfall. The rainy months are predominantly June through November, but any month can be quite wet. The elevation ranges from about 540 to 1633 m at the summit. Because of the high rainfall, erosion is rapid and large mudflows have occurred. The devastated areas and lava flows of Arenal Volcano in Costa Rica present an excellent opportunity to isolate environmental variables influencing vegetation. Furthermore, the frequency and intensity of the current eruptions provide numerous research opportunities for geologists.

A number of projects are under way: (1) vegetative and acid rain studies of permanent 10-m plots on lava flows of different ages (including the 400-yr-old flow), (2) established plots of varying sizes in the main devastated zone west of the volcano to study the islands of vegetation present there, (3) soil development studies, including soil chemistry, (4) studies of the dynamics of past and present eruptions, and (5) comparison of these studies with what is known from other volcanos in Costa Rica.

The facilities are located on a site about 2.5 km south of the volcano and separated from it by the valley of the Rio Agua Caliente. The Observatory is on a ridgecrest facing Arenal at 740 m elevation; from this vantage point one has an excellent view of the volcano. Facilities include three buildings, as well as the elevated observatory platform. The lab building has three rooms, tables and stools and one sink. The dormitory has four rooms, each with six bunkbeds (24-person capacity), and a cold-water bathroom. The dining hall and kitchen are located in the third building, and the entire operation is run by staff. Electricity is available in the evenings.

The Observatory is the result of conversations between Prof. Rodrigo Gamez and Melson at the March 1986 Board meeting of the Organization for Tropical Studies. At this meeting Melson was put in contact with Senora Marigold Genis, who along with her father, Senor Alex Murray, agreed to finance and construct the present laboratory on their property along lines suggested by Melson and Funk. It was completed in April 1987 and first used by the authors in cooperation with Rodrigo Saenz, Jorge Barquero, and Eric Fernandez (Universidad Nacional, Heredia) with an Earthwatch group.

We encourage scientific groups to contact the authors and to write directly to Senora Genis (Apartado 118, 1150 La Uruca, San Jose, Costa Rica) for additional information and reservations. However, please bear in mind that this facility was constructed by Senora Genis out of her deep commitment to conservation and is for research and teaching

purposes only. At this time unannounced drop-in visits are not possible. There is a modest charge that includes meals (ca. \$20/day/person) and a minimum number of six per group.

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