Geophysical Research Abstracts,
Vol. 11, EGU2009-13761, 2009
EGU General Assembly 2009

Analyses of characteristics and triggering mechanisms of lahars on active volcanoes and modelling of the dynamics of propagation and deposition

G. Devoli (1), F.V. De Blasio (2), V. Tenorio (3), E. Talavera (3), D. Escobar (4), and J. Cepeda (5)

(1) Norwegian Geotechnical Institute, NGI, Oslo, Norway (gde@ngi.no), (2) University of Oslo, Department of Geosciences, UiO, Oslo, Norway , (3) Instituto Nicaraguense de Estudios Territoriales, INETER, Managua Nicaragua , (4) Servicio Nacional de Estudios Territoriales, SNET, San Salvador, El Salvador, (5) International Centre for Geohazards, ICG, Oslo, Norway

Lahars on active volcanoes can occur during an eruptive phase (syn-eruptive or primary lahars), during periods of reduced magmatic activity or during periods of quiescence associated to the post-eruptive remobilization of voluminous ash and tephra deposits, months or years after eruptions (post-eruptive lahars).
In this research, we investigate the occurrence of lahars on Central American volcanoes (San Cristóbal and Concepción volcanoes in Nicaragua and San Miguel volcano in El Salvador) where low magnitude lahars are quite well known phenomena for the population living on the flanks. Within the last decade, lahars have occurred every year producing damages to crops and roads located in their lower flanks. On several occasions, inhabitants of the southern flanks of San Cristóbal volcano have been evacuated. Since the end of the 80's the national scientific community is making efforts to recognize and evaluate the hazard posed by these events and to improve hazard maps and evacuation plans.
We present how field and instrumental seismic data have been combined with empirical data and numerical simulations, to provide a better understanding of lahars physical characteristics, triggering mechanisms, dynamics and behaviour, which are crucial for realistic hazard assessments and implementation of mitigation measures. The collection of recent lahars data allowed defining the causes that condition and trigger lahars, to preliminary assess lahar frequency and to understand the relation between lahar occurrence, rainfall, the presence of altered areas and volcanic and seismic activity. Numerical simulations helped to assess quantitatively the rheological behaviour of lahars and improve estimations of run-out distances.