



## **I-MOD3D: an integrated tool for hydrologic and stability analysis of steep-slopes in shallow pyroclastic deposits**

Emilia Damiano (1), Lucio Olivares (1), Roberto Greco (1), and Vincenzo Savastano (2)

(1) Seconda Università di Napoli, Italy (emilia.damiano@unina2.it), (2) STIIA, Ercolano (NA), Italy

A numerical tool is presented to evaluate rainfall effects on infiltration and on stability of steep slopes covered by shallow pyroclastic deposits. The tool, developed by researchers of the Second University of Naples, includes a 3D volume finite model developed for saturated-unsaturated porous medium associated to a software for stability analysis in the hypothesis of infinite slope. The code (I-MOD3D) was developed as a Visual Basic Application for ARC-GIS 9.2 to automate the mesh generation and the definition of geotechnical model starting from a Digital Terrain Model. The code was calibrated and validated respectively through back-analysis of infiltration tests on slope model (Olivares et al. 2009) and of in situ suction measurements (Olivares and Damiano, 2007). The results of a series of numerical simulations aimed to reproduce the hydrological response of an instrumented site located in a mountainous area near Naples, which was interested in the past by a catastrophic flowslide, are reported which shown the reliability of the numerical tool to predict the slope response during years 2006 and 2007.