

Interactive comment on “Hydrological control of large hurricane-induced lahars: evidences from rainfall, seismic and video monitoring” by Lucia Capra et al.

L. Marchi

lorenzo.marchi@cnr.it

Received and published: 27 October 2017

The paper of Lucia Capra and her colleagues provides a valuable contribution to the analysis of the relationships between flood runoff formation and lahar occurrence during hurricanes. Lahar monitoring and characterization of hydraulic properties of soils in a difficult environment deserve to be stressed. The aim of this note is to propose some comments on specific aspects of the analysis.

The core of the study is the assessment of the runoff response to hurricanes and the comparison of simulated flood hydrographs with the monitored lahars. Since no measurements of water discharge are available in the studied catchments, rainfall-runoff

C1

modeling (this term should be preferred to “rainfall simulation”) remains essentially uncalibrated. It is well-known that a careful selection of model parameters does not ensure a satisfactory correspondence between simulated and real hydrographs. The lack of rainfall-runoff model calibration and the impossibility of performing it in the studied catchments should be acknowledged and discussed. More could be said, moreover, about the propagation of rainfall excess computed by means of the SCS Curve Number method: this part of runoff simulation is of utmost importance for the timing of flood response. A sensitivity analysis on rainfall-runoff model parameters, although does not surrogate model calibration, could help coping with the uncertainties in the assessment of flood response.

The impossibility of calibrating rainfall-runoff models is the reason why simulated water flood hydrographs have seldom been compared with observed debris flow hydrographs in catchments instrumented for debris flow monitoring.

A possible, even if only partial, check of model results with the observed runoff response could consist in the comparison of the time of the first rise of the simulated hydrograph with video images showing the onset of the water flood at the monitoring stations. According to figure 8, this comparison could be possible for Hurricane Manuel at Montegrande (Fig. 8b) and Hurricane Patricia at La Lumbre (Fig. 8d), whereas the early occurrence of lahars prevents it in the other two cases (Figs. 8a and 8c).

Interactive comment on Nat. Hazards Earth Syst. Sci. Discuss., <https://doi.org/10.5194/nhess-2017-354>, 2017.

C2