

## ***Interactive comment on “Landslide susceptibility from mathematical model in Sarno area” by G. Capparelli and P. Versace***

### **Anonymous Referee #1**

Received and published: 16 December 2013

Review of the manuscript

“Landslide susceptibility from mathematical model in Sarno area”

by G. Capparelli and P. P. Versace

General Comments

This paper focuses on the analysis of landslide susceptibility in a Mediterranean area where devastating mud flow occurred a few years ago. A model that coupled a hydrological module and a slope stability module was used to effectively simulate the sub-surface processes that produced critical conditions in the study area. The manuscript is concise and well written. The results are clearly presented. However, there are

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some issues that, in my opinion, the authors should address before the paper can be accepted for publication in this Special Issue. Therefore, I recommend a moderate revision of the manuscript.

Specific Comments

-First of all, the results section could be expanded, perhaps including additional virtual experiments that could prove the suitability of the model for application in Mediterranean slopes with pyroclastic soils. Additionally and/or alternatively, I wonder if other sub-areas in the Pizzo d’Alvano study region could be showed for some simulation tests.

-A very critical issue in this manuscript is the lack of critical discussion and comparison with other works in the literatures. I recommend to expand the discussion section, commenting the results also in the light of what is shown by other experimental and modelling findings by various authors in different geographical, topographic and geotechnical conditions.

-The abstract does not go to the point and includes not relevant information regarding the paper. I think it should be rewritten focusing on the results. Lines2 (after the bracket)-10 can be removed and the abstract can begin with the sentence at line 11.

-The study area should be shown in a better way than by a simply photo. I suggest including a map in Fig 1 where the zone chosen for simulation is showed.

-More information should be provided on the collection of soil samples for the determination of mechanical properties (P12649, L19-20). How many samples have been collected? How much variability exists between samples? How this variability can potentially affect the results? Moreover, more information should also be added when describing tensiometric data (P12648, L20-21 and P12650, L18-20) even if reported in previous publications of the same authors. How many tensiometers have been installed? At which temporal resolution? Where have they been located? Is it possible to show them on the revised map (see my comment above)? Are they representative

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of the moisture conditions in the study area?

-Explain which data have been used to build the plot in Fig. 2.

Minor and Technical Comments

P12644, L1. Change 'accepted' into 'recognized'

P12644, L14. Add 'for' between 'Saturated' and 'Unsaturated', as reported later in the manuscript.

P12644, L18. Add 's' to 'damage'

P12644, L19-20. Reformulate: 'rainfall is one of the most important factors that...'

P12645, L1-2. This sentence is quite poor and need to be widened.

P12645, L4. This sentence should be introduced with another sentence about modelling. Explain what kind of 'approaches' you mean.

P12645, L9-11. The approach reported in the first category is not complete. Can the authors please add information whether a statistical analyses on historical data is needed? Replace 'heights' with 'depth'.

P12645, L11-13. Too many references. Please, report only the most relevant or the most recent ones.

P12645, L11. 'Capparelli and Versace 2011' is reported as 2010 in the reference list. Please, correct the wrong one.

P12645, L16. Add 's' to 'mechanism'

P12645, L18-21. Too many references. Please, report only the most relevant or the most recent ones.

P12645, L27. Change into 'take into account'

P12646, L8. Explain shortly the concept of non-stationary conditions due to rainfall

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infiltration.

P12647, L8. If possible, add a reference here.

P12647, L9-11. Can the authors add information about the damage quantification?

P12648, L16. Add 'it' before 'was'.

P12649, L13. Give a reference.

P12650, L1-2. Give reference (here and later in the text) for Dirichlet and Neumann.

P12651, L1. Replace 'is' with 'was'. Add the measurement unit. What was the typical psi values (just to compare it with the reported one of 10<sup>-5</sup>)?

P12651, L13-14. Delete and start the next sentence with 'The diagrams in Figs. 4 and 5...'

P12651, L24. It does not look that close to me.

P12659, L9. Even if obvious, define what 'FS' stands for.

P12652, L13. 'relevant results': specify and discuss

Tables and Figures Table 1. In the caption, specify which type of floodslides are reported.

Fig. 1. See my specific comment above.

Fig. 2. Is it possible to add the two sections reported in Fig.

Fig. 4. Change 'Sez' into 'Sect.' or 'Section', both in the graph and in the caption.

Fig. 5. Specify what 'UW' means.

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Interactive comment on Hydrol. Earth Syst. Sci. Discuss., 10, 12643, 2013.

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