Nat. Hazards Earth Syst. Sci. Discuss., 2, C2592–C2595, 2014
www.nat-hazards-earth-syst-sci-discuss.net/2/C2592/2014/

Natural Hazards and Earth System Sciences
Discussions

Interactive comment on "The influence of the grain-size, mineralogical and geo-chemical composition on the Verdesca landslide" *by* V. Summa et al.

E. Tavarnelli (Referee)

enrico.tavarnelli@unisi.it

Received and published: 29 November 2014

Review report by Enrico Tavarnelli for manuscript n. 159 by Summa et al., titled "The influence of grain-size, mineralogical and geo-chemical composition on the Verdesca landslide", submitted to NHESS

The results of a detailed analysis carried out along the Verdesca landslide, a major geomorphologic instability in the Agri Valley tectonic trough, located in the heart of the southern Apennines of Italy, are presented. This area exhibits a high natural vulnerability, amplified by the fact that it is densely populated. The study of the geological history

of such an environment is therefore of major interest for an improved understanding of instability processes within fault-controlled intramontane basins, and for an enhanced knowledge necessary when evaluating natural risk in analogue settings. The Verdesca landslide has been investigated in detail through analysis of the mineralogical and geochemical content of the terreins affected by the gravitational movement. A borhole has been dug and samples collected therein were analysed. A slip surface was detected, and its mineralogical and geochemical composition was defined. The stratigraphic log defined in the borehole correlates positively with those reconstructed in other nearby boreholes, providing original evidence to constrain the geometry and evolution of the landslide, and to infer the depth of the main slip and detachment surfaces. To my knowledge, good credit is given to previous work and existing literature, both methodological and regional. However, other recent works have not been considered and should, in my opinion, be acknowledged in order to update the list of the references cited in the text. The English form is generally good. The illustrations are all necessary and clear. I found the manuscript very well prepared, well organized and very interesting for a broad audience of both Apennine and non-Apennine specialists, as well as for both geological/geomorphological, engineering and mineralogical-geochemical communities. The outcomes of this study are ultimately a key tool for a correct evaluation of the geomorphological hazard of densely populated areas. It is therefore my opinion that the manuscript is perfectly pertinent and suitable for publication on NHESS. I recommend its publication after only very minor revision, that should consist in the implementation of the reference list and in the alteration of a few sentences. A set of specific, suggested changes keyed to the text is listed separately. I require no anonymity, wish to be identified by the Authors and remain available to them and to the Editor for eventual clarification. Thank you for asking me to review this stimulating contribution for NHESS. With my warmest regards, yours sincerely Enrico Tavarnelli

A) OBSERVATIONS AND SUGGESTED ALTERATIONS TO THE TEXT:

Please Note: - The suggested changes are indicated in yellow; - the sentences to

revise/correct/rephrase are indicated in red; - the references to acknowledge are indicated in green.

1) Page 5048, line 19: there could be some relation between . . .constrained (instead of “links”).

2) Page 5049, line 20: . . . a continental clastic Quaternary sequence crops out; it is mainly represented. . ..

3) Page 5049, line 25: . . . massive coarse deposits, such as matrix-to clast-supported gravels and conglomerates . . . .

4) Page 5050, line 5: the Authors should acknowledge here, after Critelli & Loiacono, 1988, the paper by Butler & Tavarnelli (2006, Sedimentology), and references therein, on the nature, lithology and architecture of the Gorgoglione Flysch deposits, that are the substratum to the Verdesca landslide, object of this contribution.

5) Page 5050, line 6: the Authors state that the study area is affected by extensional faults of the Val d’Agri Fault System, and duly acknowledge the work by Cello and co-workers. However, the Authors should also acknowledge more recent contributions on this topic, specifically those by Bucci et al. (2012, Journal of Maps), and by Bucci et al. (2014, Journal of the Geological Society of London), that have outlined many analogies, but also several differences with the evidence described by Cello co-workers.

6) Page 5052, line 21: silty-clayey sediments, at a width of about 50 cm. The sub-sentence in red is not clear to me. Does it mean “with a width of about 50 cm”? The Authors should clarify this and correct the sub-sentence accordingly.

7) Page 5053, line 16: . . . observations of the geognostic cores, that show evidence of saline and oxide precipitates.

B) SUGGESTED ALTERATIONS TO FIGURE CAPTIONS:

1) Page 5064, Fig. 1. The inset shows the location of the study area with a red dot. Its

present position in the Figure inset, located south of the Gargano peninsula in Apulia, is not correct. The correct position of the study area in the inset of Fig. 1 must be corrected, and must fall in the central part of the Basilicata region.

C) REFERENCES THAT MUST BE ACKNOWLEDGED:

1) Butler R.W.H. & Tavarnelli E. (2006) - The structure and kinematics of substrate entrainment into high concentration sandy turbidites: a field example from the Gorgoglione "flysch" of southern Italy. Sedimentology, 53, 655-670.

2) Bucci F., Novellino R., Guglielmi P., Prosser G. & Tavarnelli E. (2012) - Geological map of the northeastern sector of the high Agri Valley, Southern Apennines (Basilicata, Italy). Journal of Maps, 8, 3, 282-292.

3) Bucci F., Novellino R., Tavarnelli E., Prosser G., Guzzetti F., Cardinali M., Gueguen E., Guglielmi P. & Adurno I. (2014) – Frontal collapse during thrust propagation in mountain belts: a case study in the Lucania Apennines, Southern Italy. Journal of the Geological Society of London, 171, 4, 571-581.

Siena, Italy, 29 Nov. 2014 Enrico Tavarnelli

Interactive comment on Nat. Hazards Earth Syst. Sci. Discuss., 2, 5047, 2014.