

Interactive comment on “Basic features of the predictive tools of early warning systems for water-related natural hazards: examples for shallow landslides” by Roberto Greco and Luca Pagano

Anonymous Referee #2

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General comments: The paper is mainly focused on the definition of basic features characterizing the predictive model. Then, three alternative models which could be implemented in the predictive tool are described by means of three case studies at a slope scale. The manuscript is difficult to follow and awkward in many parts (the abstract is an example). The text would benefit from some language copy editing. The current version of the paper lacks of original features, and it basically appears as a technical note rather than a research article. However, I have a number of major comments on the structure and contents of the paper that deserve some further work.

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According to the following considerations my recommendation for this manuscript is accept pending major revision. According to the title the main issue of the paper should be the description of basic features of the predictive tools employed in EWS for water-related. However, only examples of shallow landslides have been provided. Thus, I would suggest to modify the title according to these considerations. It is well known the different scales of analysis at which landslide early warning systems (LEWS) may be employed. I think could be useful to define in the Introduction, at which scale the Authors are referring to. As stated at page 10 line 31 the example are all referred to a slope scale. Does the paper refer exclusively to LEWSs at a slope scale? Many differences can be observed among LEWSs employed at a local or regional scale. Concerning the structure of the paper, Section 2 appears to be not coherent with the aim and the content of the paper. I would suggest to include the text concerning the uncertainties of prediction into Section 3 and to delete the remaining text, because it doesn't provide any evidences on costs connected to false and missed alerts nor how to minimize them. Section 3 introduces three evolution stages for a natural hazards. Is this an original proposal or it's derived by literature? Please provide some references. Then the content of this section is not coherent with the title. In particular the evolution stages of different natural hazards (seismic, snow-avalanche, overflow, rainfall-induced landslide) are presented. I think it's not necessary to mention them all, since the title and the abstract exclusively refer to water-related hazards. Section 4 should be the core of the paper, I suggest to clear describe what the authors consider as a predictive tool and where in the structure of a EWS it fits. Regarding the structure of EWS and, in particular for LEWS, there are many missing references that could be considered in order to improve the discussion (see References below). The same references needed to be taken into account for the text at page 3 lines 19-33. Furthermore, in literature there are many contributions of several authors concerning tools for the issuing of warnings which have been implemented in LEWS. I suggest the Authors to consider these contributions (see References attached), in order to improve the comments in Section 5 concerning the architecture of the predictive model. Furthermore

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they can be used as examples to support the different classification criteria defined. In Section 5, performance evaluations (I mean the same analysis already performed for the stochastic approach) of the empirical approach and of the physically-based model should be carried out to better express judgments and to compare their results. The conclusion ends rather abruptly, the authors do not clearly present their conclusions and text is too short. A big-picture summary statement or some comments on the importance and usefulness of defining basic features of the predictive tools used in EWS would be a necessary concluding remark. In addition, the sentence of page 17 lines 22-24, is not supported by data and, the sentence of page 17 lines 27-30 is a repetition of the abstract and it is not appropriate for the conclusion.

Specific comments: Pag. 1 lines 3-5: this sentence is awkward. please rewrite Pag. 1, line 9 and pag. 4 line 7: Incardinated?? Probably has not the meaning the authors suppose. Please check. Pag. 2, lines 32-36: More recent references are available for LEWS dealing with rainfall-induced landslides. Pag. 3, line 6: Are other references available for snow avalanches EWS? Pag. 4, line 29: Please change “sends” with “issues” Pag. 8, line 23: Please change “of aid in” with “aiming at” Pag. 11, lines 6-17: Please define in the text the meaning of hdL and hdS Pag. 18, line 21: The reference Capparelli G., Versace P.: FLaiR and SUSHI: two mathematical models for early warning of landslides induced by rainfall, *Landslides*, 8(1), 67-79, <http://dx.doi.org/10.1007/s10346-010-0228-6>, 2011 (pag. 24, lines 24-26) is present only in the reference list but not in the text.

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