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Discussions

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comment

Interactive comment on "Assessment of shallow landslide susceptibility using an artificial neural network in Enshi region, China" *by* Bin Zeng et al.

Anonymous Referee #2

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GENERAL COMMENTS

In this paper the authors implemented an artificial neural network (ANN) approach for analyzing landslide susceptibility within a certain geological unit in a study area in China, taking into account four different factors related to the landslide mechanism, and endangered slopes rather than already failed slopes as positive inputs for the model.

As I see it, the overall quality of the paper is at this point not adequate for publication in NHESS, and I suggest major revisions.

First of all, the English language needs improvement, with many grammatical errors and imprecise wording, and the manuscript should be completely revised by a more proficient English user. Secondly, the description of the methodology is not straightfor-

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Discussion paper

ward and it is hard to follow what exactly the authors did and where the data comes from. The discussion of the results and the performance evaluation are very short and not going into detail enough or documented with adequate performance evaluation methods. Finally, it is hard for me to see the scientific contribution of the work. There are already many papers using artificial networks for landslide susceptibility analysis. The idea of investigating only a single geological unit is not new to me, neither is the implementation of the catchment area as input. The principle of using endangered slopes as input rather than occurred landslides is interesting, but not explained enough, particularly regarding the mapping and generation of such an inventory, as well as issues arising from its completeness or incompleteness. The implications of the results for advancing the understanding of natural hazards are not pointed out enough.

SPECIFIC COMMENTS

Line 64: unclear what the authors mean with "intelligent method".

Line 78: "valuation index system" is unclear.

Line 80: "empirical" instead of "experiential"?

Lines 80 to 81: The role of expert knowledge and experience: Is not one of the major points of data driven landslide susceptibility analysis to move away from expert knowledge towards being more objective?

Lines 194 and following section 3.1.2: Here it is hard to understand what exactly was done without having the information about the input data, such as DEM and grid size, which is given later in the results chapter 4.

Line 210: where is 50 m defined as the minimum grid size for statistical analyses? Is that in any other publication? It is unclear if it was used here. Later the DEM is referred to with a 25 m grid size. This is very confusing.

Lines 212 and following: Where does the SC come from? Is it quoted from another publication?

Lines 227 to 232: It is unclear how the structural geological model was generated and what kind of input data was used for it. This is a nontrivial issue and it needs to be clarified.

Line 237: "…avoid the interference of human factors." Here the authors contradict the statement from lines 80 to 81.

Line 272: Can the authors give more details about the "traingdx" function?

Lines 289 to 294: Which sampling units were used for the calculations? Grid cells? Slope units? How many grid cells correspond to the respective samples? Similar Line 314: How many grid cells/sampling units do the different samples correspond to? This is crucial for the reader to understand the sample size and the significance of the analysis.

Line 317 and following section 4.1: This section should be moved to the methods chapter.

Lines 359 to 362: This statement and the general performance of the model should be better quantified with adequate indices.

Line 249: I do not understand in which regard the assessment was dynamic.

Quality of the results and discussion in general: The presented results are of only little significance. Neither do the authors point out a way of optimizing the model, e.g. by changing the architecture of the ANN or set of input variables, or using committees, nor do they go into depth when interpreting the results regarding the very particular landslide mechanism or point out weaknesses of the approach. Also, the figures and tables supporting the presentation of the results are not adequately explained and discussed in the text. They cannot be considered self-explaining.

Lines 384 to 392: points 1 and 3 are not new to me, point 2 not explained enough, so I have doubts regarding the novelty of this research. Moreover, the implications of the achievements and possible practical implementations are not pointed out.

C3

Fig. 3: What are the profile lines in the figure? Are they of any relevance? Otherwise they should be omitted.

TECHNICAL CORRECTIONS

Many grammatical errors all over the manuscript that have to be fixed.

Lines 44 and 46: Pradhan and Lee 2010 should be distinguished, there are two publications in the reference section.

Lines 54 and 61: Spelling of author Pourghasemi incorrect.