



Interactive
Comment

Interactive comment on “Which data for quantitative landslide susceptibility mapping at operational scale? Case study of the Pays d’Auge plateau hillslopes (Normandy, France)” by M. Fressard et al.

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General Comments

The manuscript addresses relevant scientific and/or technical questions within the scope of NHESS by discussing effects of quality of input data on landslide susceptibility assessment.

Specific Comments

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1. In the discussion of the State of the Art (Section 1) a reference is missing to physically based methods to assess landslide susceptibility.
2. In the end of page 959 the calibration and validation of models are presented as steps that increase the cost of landslide susceptibility. This is not clear and authors should clarify this point.
3. It is not clear for the reviewer the nature of the superficial deposit numbered (3) in Section 2.1. Authors are asked to be more precise when describing the origin of deposit. In addition, may authors provide any indication concerning thickness of deposits?
4. When describing the landslide data (Section 2.2) a reference is missing regarding the number of landslides. Figure 3 is meaningless because authors use 3 different landslide inventories and it is not declared to which landslide inventory the figure applies.
5. In addition, authors state that solifluction were considered inherited from quaternary and stable. However, figure 3D does not indicate any stability of solifluction. Furthermore, deep seated landslides are considered as naturally stabilized. Authors must be carefull with this consideration; maybe these landslides are is a dormant state of activity.
6. The modeling strategy is the section that needs further clarifications 6.1 Authors should clearly state the number of landslides they use in each inventory. 6.2. Apparently, the landslide inventory based on field mapping (the most reliable) contains just 27 shallow slides that were used to model landslide susceptibility. Authors should discuss the representativeness of this landslide database and its reliability and consistence to evaluate susceptibility. 6.3. The landslide inventory # 3 used for model contains only shallow slides. The type of landslides in landslide inventory #1 is unknown. Are authors confident they are comparing the same type of landslide? 6.4 A figure showing the complete landslides inventories is missing in the manuscript. 6.5

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Authors use the arcdsm extension to model landslide susceptibility. With this tool the dependent variable should be in point format. None information regarding this is given in the manuscript and this is a major pitfall. How was prepared the three landslide themes to enter into the arsdm tool? How many points per landslide were considered? And what about the location of the point? 6.6. In addition, information is missing regarding the landslide feature used to validate. In fact, what did authors validate (for both calculation and validation)? The total landslide area? The total landslide depletion area? The centroyds of landslide? 6.7. Authors classify the 5 landslide models by identifying natural thresholds on the cumulative-area posterior probabilities (CAPP) curve. Maybe the use fixed logistic scores to define susceptibility classes will facilitate model comparison.

7. The section 5.3 is not “in the line” with the rest of the text. The reviewer does not understand the existence of section 5.3. It is not the aim of the manuscript to evaluate advantages and pitfalls of logistic regression to assess landslide susceptibility. I propose to eliminate section 5.3.

Technical Corrections

Page 959 Line 1 – “Mulder” instead of “Mudler”. Line 2 – “important cost and time consuming measurements” instead of “important measurements”.

“This method is the most widely used for establishing of official susceptibility and hazard maps in operational contexts.” This sentence should be supported by some reference(s).

Page 960 Line 13 – “However, there is a demand” instead of “However, there’s a demand” Line 14 – “in landslides hazard management” instead of “in landslides hazard managements” Line 24-25 “This area is considered as a test study site that aims to calibrate the methodology and identify the necessary data”. This sentence needs to be reviewed and rewritten.

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Page 964 Line 16-18 “The only landslides referenced by the BRGM in the database with a high degree of certainty and a reasonable spatial accuracy were used for the analysis.” This sentence is not clear.

Line 23-25 “Moreover, the distinction of type and activity of the landslides is difficult and imprecise on the only basis of the photo-interpretation of the ortho-images (quality and resolution of the images, landcover). Not clear the text within brackets.

Page 967 Line 4 “A grid cell model was used to map the susceptibility as it is the most” instead of “A grid cell model was used to map the susceptibility as they are the most”

Page 969 Line 18-19 (Table 3) instead of (Table 2).

Page 970 Line 12 “in the sect. 3” instead of “on the sect. 3”.

Page 972 Line 8-9 “(i.e. the models have difficulties to predict the location of independent landslides).” Instead of “(i.e. the models have difficulties to predict the location of future landslides)”.

Line 11-14 “Visually, the two maps have very complex zoning characterized by serious artefacts, brutal changes in the susceptibility over very small zones and do not permit identifying a realistic and applicable zoning (Fig. 10).” Sentence not clear.

Page 982 Line 13 “Mulder” instead of “Mudler”.

Figure 1 Scale is missing in sketch A; It is not easy to localize figure A in the map of France.

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