

Interactive comment on “Creating a national scale debris flow susceptibility model for Great Britain: a GIS-based heuristic approach” by Emma J. Bee et al.

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This manuscript is presenting the procedure for a national debris flow susceptibility map. The susceptibility model is based on three factors that are weighted based on expert judgement. The manuscript is very well structured, written, and illustrated. However, there are several points that need improvement.

Care should be taken when using the terms susceptibility and hazard. A hazard assessment is something completely different than a susceptibility analysis and cannot be used synonymously.

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Different models and different weightings should have been tested and evaluated in order to find the best susceptibility model. Furthermore, the usage of only one parametrisation for the entire country is obviously not appropriate. This is confirmed by the fact that the susceptibility map performs much better in the validation area, then it does for the entire country. Parameters and weights are likely chosen optimal for this validation area, but not for other areas of the country. Topography, geomorphology, geology and climate is varying significantly over different regions in Great Britain and the model should be adapted to this variation. This could be done by separating the model into zones of different regions and landscapes. In addition, the two used parameters “debris material” and “permeability score” are not independent. This may lead to an overestimation of susceptibility in certain areas.

One of my major concerns is the use of a 50 m resolution DEM. I think this is too coarse in order to be able to get relevant information regarding the detection of starting zones for debris flows.

I also think, that areas below a certain slope angle should rather be excluded from the model. This is a physical restriction which is independent of all the other parameters.

Several specified data sets are used, but not presented in detail. The manuscript gives no insight about what they present, on what they are based on and what their scales are. In order to evaluate the susceptibility model, detailed information and understanding of the input data is inevitable. I propose rather to use the original data and then implement the algorithms used to produce the specialized data sets directly in the susceptibility model. This would also help to avoid doubled parameters.

Adding a table with all recorded events including the scores they get for each single parameter as well as the final susceptibility score would be beneficial.

More specific comments can be found in the attached commented version of the manuscript.

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Please also note the supplement to this comment:
<https://www.nat-hazards-earth-syst-sci-discuss.net/nhess-2019-54/nhess-2019-54-RC2-supplement.pdf>

Interactive comment on Nat. Hazards Earth Syst. Sci. Discuss., <https://doi.org/10.5194/nhess-2019-54>, 2019.