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Natural Hazards and Earth System Sciences
Discussions

Interactive comment on "Assessing the quality of landslide susceptibility maps – case study Lower Austria" *by* H. Petschko et al.

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General reply

The authors would like to thank Referee #2 for the thorough review and the manifold comments to improve the manuscript and the discussion of the results. The revised manuscript was changed to address the questions and concerns raised in the referee comments, to prohibit misunderstanding by the readers of the general purpose and intention of the presented study and to improve the traceability of the applied methods. After this general reply to the general comments our answers on the specific referee comments follow. These were addressed in a step by step manner including a reply to the comment but also the respective extract form the revised manuscript where

applicable.

Generally, the introduction, section 2 on the considerations on quality of a susceptibility map, the discussion section and the conclusions were modified substantially in the revised version of the manuscript. Therefore, some references to the page and line in the original manuscript might not be straight forward without the context of the revised manuscript. Where applicable or necessary we inserted the entire section in this author reply to give the reader the possibility to grasp the context. Furthermore, a flow chart on the presented study was included to present all aspects covered in this work at a glance in the revised manuscript.

We are thankful for the issues raised in the general comments. We would like to address these in the following:

As this study is only focussing on a statistical assessment of landslide susceptibility the possible applicability or transferability to other, e.g. deterministic approaches, was not considered and unfortunately initially also not mentioned in the manuscript. The authors are aware of the range of different approaches (heuristic, statistic and deterministic; Soeters and Van Westen, 1996) available to conduct a susceptibility or hazard assessment. We included a clarification of the range of approaches available and some broader picture on considerations on quality and epistemic and aleatory uncertainty in the revised manuscript. Furthermore, we pointed out more clearly that we are focussing on aspects concerning the quality of statistical approaches only. This was also included into the abstract.

More references and contemplation on results of similar studies and to the recommended work by van Westen et al. (2005, 2008) were included in the revised version.

Referee #2 asked for more information on the landslide inventory used for the analysis. Regarding a map of the point inventory we would like to refer to our other publications (Glade et al., 2012; Petschko et al., 2013a), as space is limited within this publication. Furthermore, one result of the previous research the landslide density according to

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this inventory was presented in Table 1 in the original manuscript. To accelerate the mapping process and keeping in mind the expected number of landslides (resulting 12,899 landslides) in the inventory, no attributes (or codes) were assigned to each point. As Malamud et al. (2004) stated assigning additional attributes is very time-consuming, particularly considering large datasets. However, the authors hope to be able to map more attributes to each point and also the spatial extent of the landslide (polygons) in future. Some more details were inserted in our reply on comment number 14 and in section 4.1 of the revised manuscript.

Regarding the concerns that the GAM model is not applicable in other cases and locations we would like to refer to its broad usage in ecological modelling (Guisan et al., 2002) but also to other applications in landslide susceptibility modelling worldwide (Brenning, 2008; Goetz et al., 2011; Jia et al., 2008; Park and Chi, 2008; Vorpahl et al., 2012). We moved this references to other studies from the methodology section to the introduction of the revised manuscript (please see the reply to the specific comments and the revised version of the manuscript referring to this).

For our answer on the added value of a k-fold cross-validation please refer to our reply on comment number two in this document.

The numbering of the equations and tables was revised. The English editing was done by an English native speaker.

Please see the document in the supplementary material for our reply to the specific comments.

Please also note the supplement to this comment:
http://www.nat-hazards-earth-syst-sci-discuss.net/1/C1214/2013/nhessd-1-C1214-2013-supplement.pdf

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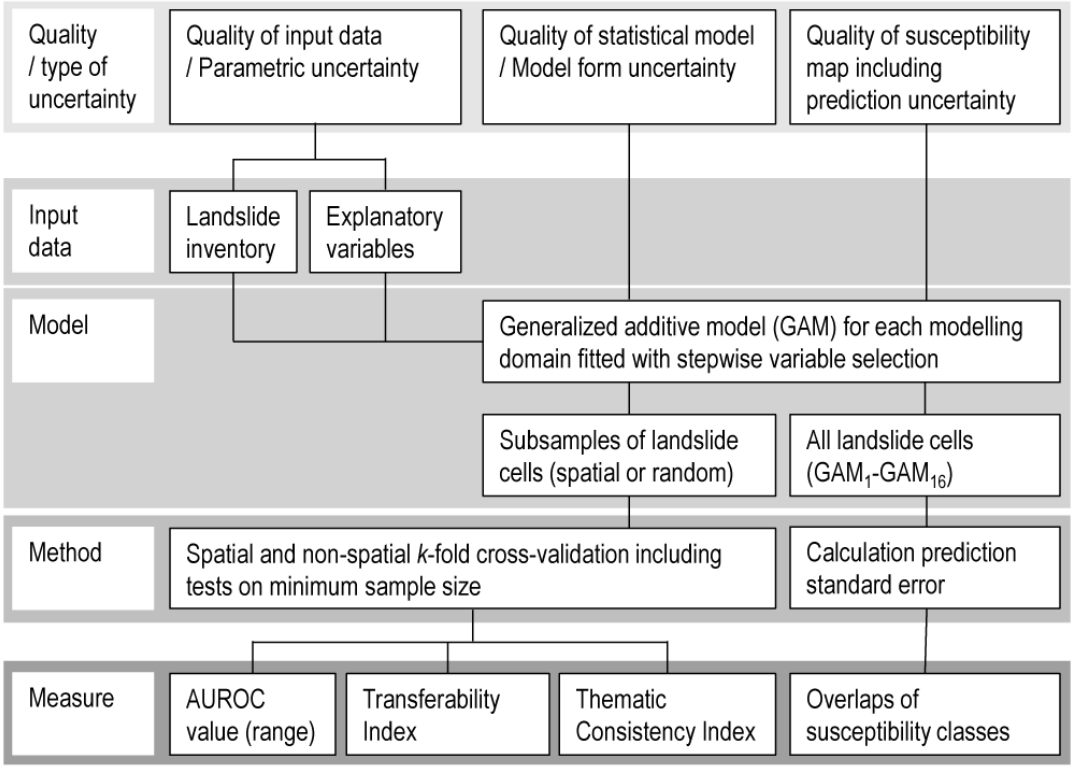

Fig. 1.

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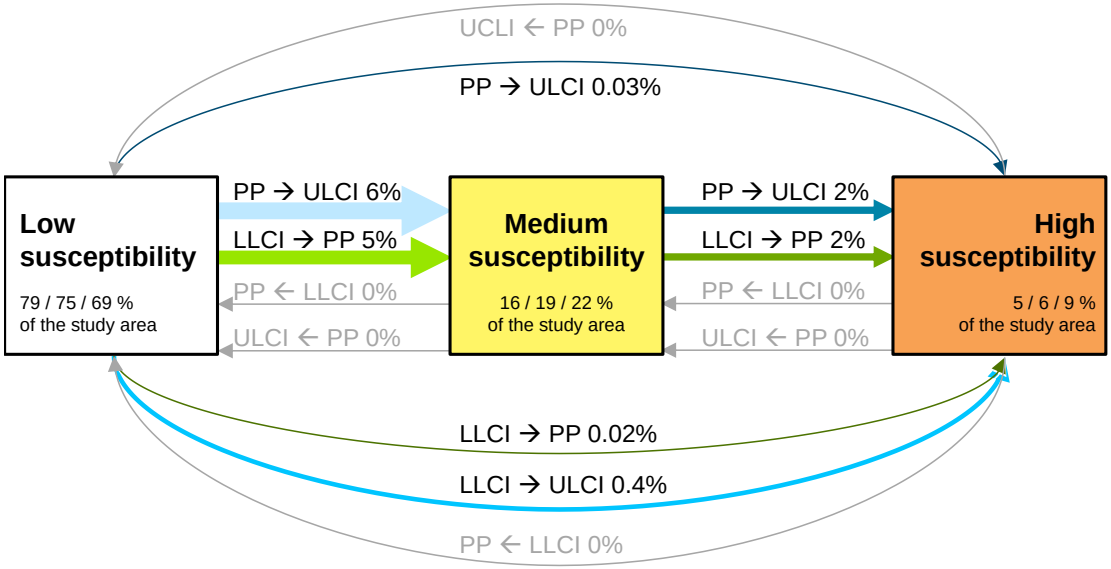

Fig. 2.

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