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Natural Hazards and Earth System Sciences
Discussions

Interactive comment on "Debris Flow Risk Mapping Based on GIS and Extenics" *by* Wenbo Xu et al.

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The paper entitled "Debris Flow Risk Mapping Based on GIS and Extenics" describes an approach to classify regions with high debris flow probability in China.

Even though the the basic idea of large scale hazard indication mapping is very interesting and potenitally benefitting for many applications, the state of the paper does not allow for a decent understanding of all methods applied. Therefore I recommend a rejection of this paper.

My main arguments coming to this conclusions are the following:

- The concept of Extenics is not clear at all. It is not clear why this concept should bring benefit compared to simple correlation of the parameters. As this paper is based very much on the Extenics concept, it has to be described very clearly and carefully and it

has to be explained why it is so important for debris flow hazard mapping. It should also be compared to other, more common approaches. Right now it is only described with catchy keyword such as "innovation", "matter" , "solve contradictionary problems".

- The basic input information, relative elevation, slope, rock hardness, rainfall, gully density, vegetation coverage, historical debris flow and earthquake activity are very essential for the algorithm. But these datasets are not well described at all. A discussion on the quality and uncertainty of these crucial parameters is missing.

- The authors use a gris of 1 by 1 km spatial resolution to derive parameters sich as slope angle and elevation difference. This is way too coarse to derive these parameters for meaningful debris flow hazard detection in mountainous environments.

- The validation with points where debris flows were observed is poor. First of all, as far I understand, is the same data used as input for the model. So it could to be used for validation of the model. Secondly, nearly 50% of all recorded debris flow events fall into the classes very low, low and moderate risk for debris flow. This does not look like a very good model performance as the authors claim.

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