Geophysical Research Abstracts
Vol. 16, EGU2014-10458, 2014
EGU General Assembly 2014
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Application of indicators derived by remote sensing for mapping of landslide hazard and vulnerability

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The choice and the development of methods for risk assessment of landslides depends on several factors. Important factors are the type of landslide and the elements at risk, the choice of spatial and temporal scale, the purpose of the analysis and the needs of the end-users. In addition, data availability is a major constraint, which greatly affects the type of methods and models that can be developed. Remote sensing is a promising tool for an economical and up-to-date data collection, which also could be applied to monitor the dynamic development of risk. The spatial and temporal distribution of the risk for landslides can be assessed by monitoring hazard indicators (e.g. slope height and slope angle), exposure indicators (e.g. number of houses and the total population) and vulnerability indicators (e.g. population density, settlement structures or indicators related to structural vulnerability).

Several of the indicators applicable for landslide risk and vulnerability can be obtained by remote sensing techniques. However, for better results, indicators from remote sensing should be combined with other type of data. In this work, a review on the application of indicators for landslide risk assessment in explicit models as well as an assessment of end user needs was conducted in order to determine the most relevant indicators for landslide hazard and vulnerability. Lists of recommended indicators, mainly derivable from remote sensing, have been developed. These indicators are supposed to be used in risk assessment, e.g. by combining hazard, vulnerability and exposure indicators to produce risk indices. Moreover schemes for ranking, weighting and aggregation of the indicators into hazard- and vulnerability indices are provided.

The research leading to these results has received funding from the European Community's Seventh Framework Programme [FP7-SPACE-2012-1] under Grant agreement No 312972 Framework to integrate Space-based and in-situ sENSing for dynamic vUlnerability and recovery Monitoring(SENSUM).