



## **Localisation and assessment of potential damages in settlements and infrastructures caused by floods and debris flows as a decision basis for the prioritisation of mitigation measures**

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Hitherto, in the Autonomous Province of Bolzano - South Tyrol mitigation measures have been planned after catastrophic events with related damages. Dealing with natural hazards was based on hydrogeological expertises for single basins of torrents. The extent of potential damages due to hazardous processes has not been taken into account. Now, the planning of mitigation measures is based more frequently on risk analyses and cost-benefit analyses due to the limited financial resources of the public administration. For the best possible allocation of the limited financial resources, the Autonomous Province of Bolzano - South Tyrol decided to develop a strategy for the identification and localisation of the settlement areas and infrastructures endangered by floods and debris flows. For the spatial analysis of hazards, a combination of different GIS-based process models developed by geo7 (Berne, Switzerland) was used. The triggering areas were completely delineated from the digital elevation model and other GIS-databases. The run out areas of the dangerous processes were calculated by the use of combined empirical and physical models. The modelled process areas were verified with information about historical events. Subsequently, the run out areas of the processes were intersected with the infrastructures and buildings. Every building was characterised by the number of residential persons and its monetary value. For each process area, the number of endangered persons and monetary values were summarised (probable maximum loss). All process areas affecting settlements were listed and sorted by the number of endangered persons and monetary values. The outcome of this procedure was the knowledge about those areas where risk reduction activities

are needed and about the priority with which these activities have to be considered. Within a few months needed for the elaboration, an overview of the risks due to floods and debris flows could be given in the whole region (7000 square kilometres). The results provide important information for the planning of risk reduction and mitigation measures. Thus, the strategy for coping with natural hazards and risk becomes more transparent and efficient than in former periods.