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# Flood hazard probability mapping method

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In Sweden, spatially explicit approaches have been applied in various disciplines such as landslide modelling based on soil type data and flood risk modelling for large rivers. Regarding flood mapping, most previous studies have focused on complex hydrological modelling on a small scale whereas just a few studies have used a robust GIS-based approach integrating most physical catchment descriptor (PCD) aspects on a larger scale. The aim of the present study was to develop methodology for predicting the spatial probability of flooding on a general large scale. Factors such as topography, land use, soil data and other PCDs were analysed in terms of their relative importance for flood generation. The specific objective was to test the methodology using statistical methods to identify factors having a significant role on controlling flooding. A second objective was to generate an index quantifying flood probability value for each cell, based on different weighted factors, in order to provide a more accurate analysis of potential high flood hazards than can be obtained using just a single variable. The ability of indicator covariance to capture flooding probability was determined for different watersheds in central Sweden. Using data from this initial investigation, a method to subtract spatial data for multiple catchments and to produce soft data for statistical analysis was developed. It allowed flood probability to be predicted from spatially sparse data without compromising the significant hydrological features on the landscape. By using PCD data, realistic representations of high probability flood regions was made, despite the magnitude of rain events. This in turn allowed objective quantification of the probability of floods at the field scale for future model development and watershed management.