



The role of method of production and resolution of the DEM on slope-units delineation for landslide susceptibility assessment – Ubaye Valley, French Alps case study

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Landslide susceptibility assessment forms the basis of any hazard mapping, which is one of the essential parts of quantitative risk mapping. For the same study area, different susceptibility maps can be achieved depending on the type of susceptibility mapping methods, mapping unit, and scale. In the Ubaye Valley (South French Alps), we investigate the effect of resolution and method of production of the DEM to delineate slope units for landslide susceptibility mapping method. Slope units delineation has been processed using multiple combinations of circular variance and minimum area size values, which are the input parameters for a new software for terrain partitioning. We rely on this method taking into account homogeneity of aspect direction inside each unit and inhomogeneity between different units. We computed slope units delineation for 5, 10 and 25 meters resolution DEM, and investigate statistical distributions of morphometric variables within the different polygons. Then, for each different slope units partitioning, we calibrated a landslide susceptibility model, considering landslide bodies and scarps as a dependent variable (binary response).

This work aims to analyse the role of DEM resolution on slope-units delineation for landslide susceptibility assessment. Area Under the Curve of the Receiver Operating Characteristic is investigated for the susceptibility model calculations. In addition, we analysed further the performance of the Logistic Regression Model by looking at the percentage of significant variable in the statistical analyses. Results show that smaller slope units have a better chance of containing a smaller number of thematic and morphometric variables, allowing for an easier classification. Reliability of the models according to the DEM resolution considered as well as scarp area and landslides bodies presence/absence as dependent variable are discussed.