



Landslides hazard assessment at the catchment scale by coupling a topographic indexes analysis with a hydrological physically based model

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The aim of this work is to assess the landslides hazard on a catchment within a physically based approach. The proposed method follows three steps. The first is the estimation of the elementary idromorphologic units which are assumed as the largest representative areas of the same hazard level. Different criteria are proposed for this scope all based on the spatial distribution of the physical characteristics within the unit. The second step is the estimation of the a-priori hazard index for each unit. This index is the elaboration of a stability factor and it is based on the geomorphologic features of the unit. The third step leads to the a-posteriori hazard index which consider the degree of saturation of the soil and the time persistency of the saturation. The soil moisture is computed by the TOPKAPI hydrological physically base model. A 10-year simulation has been used to estimate the monthly soil moisture in each elementary idromorphologic units and to update the a-priori hazard index. An application of the methodology has been performed on the Reno catchment in a steep silty area of the Italian Appenine. In this area a landslides hazard index was available from a long field survey. Results from the proposed methodology have been compared with the available estimations.