



## **New developments in harmonized landslide susceptibility mapping over Europe in the framework of the European Soil Thematic Strategy**

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In the context of the European Soil Thematic Strategy, and the formulation of a draft of a European framework directive devoted to the sustainable protection of soil, landslides are recognized as one of eight soil threats requiring harmonized spatial hazard indication assessments. For each soil threat, the Soil Information Working Groups (SIWG) of the European Soil Bureau Network (ESBN) outlined a set of common criteria for the delineation of priority areas based on available pan-European data at continental scale (Tier 1), and higher resolution evaluations within these areas incorporating additional spatial information (Tier 2). The initial work of the SIWG of ESBN on the landslide threat was most recently put forward by a landslide experts group coordinated by JRC Ispra. This contribution outlines the general specifications of Tier-based, nested geographical assessment applicable to landslide susceptibility at European and national scales. Since a homogenous coverage of landslide location information over Europe is missing, a heuristic assessment scheme exploiting a reduced set of landslide conditioning factors (namely slope angle, lithology and land cover) derived from common pan-European data sources is proposed for generic susceptibility evaluations at the 1:1 million scale (Tier 1). The assessment is calibrated on national levels through bivariate parameter class analyses utilizing available information on landslide locations for selected European countries holding national-level landslide inventories. Further improvements on Tier 1 regarding specific assessments for different landslide types and geomorphologic settings are presented in a case study over France. For higher resolution assessments in areas of elevated landslide susceptibility as delineated by Tier 1, a multivariate landslide susceptibility assessment approach is proposed using additional information on landslide controlling- and triggering factors, together with multitemporal landslide inventories (Tier 2). As an example, a Tier 2 assessment employing small administrative areas as mapping units is presented for Italy. Ongoing work is mainly related to the delineation of model calibration regions over Europe utilizing geomorphological, climatological, and seismotectonical data. We conclude with recommendations on further work to be carried out to conduct Tier-based, harmonized European landslide susceptibility assessments in the context of the European Soil Thematic Strategy.