

Landslide susceptibility assessment in the southern sector of the Tammaro River basin (Italy)

Mirko Ranaldo¹, Diego Di Martire¹, Sabatino Ciarcia², Domenico Calcaterra¹

¹ Department of Earth Sciences, Environment and Resources Sciences, Federico II University of Naples, Naples, 80126, Italy

² Department of Science and Technology, University of Sannio, Benevento, 82100, Italy
diego.dimartire@unina.it

Abstract.

Numerous methods have been proposed in literature for the landslide susceptibility assessment at the basin scale using a Geographic Information System (GIS). Among them, statistical methods have been becoming increasingly popular in recent years. In particular, the HTU (Homogeneous Territorial Unit) method (De Vita *et al.*, 1994; Guida *et al.*, 1996; Calcaterra *et al.*, 2010) has been applied in this work, which is well suited to problems of slope stability in flysch formations. HTU method was applied to the southern sector of the Tammaro River Basin, which corresponds to the municipality of Paduli and Pietrelcina, in the southern part of the Apennines fold-and-thrust belt (Campania Region, Italy). From a geological point of view, this area is mainly made up of argillitic-marly-calcareous and argillitic-marly complexes, known as “Varicoloured Clays”, a structurally complex formation (Esu, 1977), well known in literature for their susceptibility to landsliding. The area of interest extends for about 73 km² of hilly territory, where 303 landslides, divided in 127 earth flow, 87 rotational/translational slides and 89 earth slide-earth flow, have been mapped, at 1:5.000 scale, by means of field survey and stored in a GIS-database. Moreover, Geolithological and Geomorphological maps (at 1:10.000 scale), as GIS-layers, were used to implement the homogeneous domains for the statistical analysis. Such domains represent specific mapping units, called HTU, which define the classification of each slope-instability factor into four classes, stored into a single map, or layer. By means of the overlay of HTU map with Landslide-inventory map, the susceptibility assessment is then extended to non-landslide areas by applying a statistical method.

Keywords: landslide susceptibility assessment, HTU method, Varicoloured Clays, Tammaro River basin.