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An integrated, hierarchical, multiscale, gis_based approach to defining and mapping the landscape of Italy.

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Ecosystems are the result of a complex interaction of physical, social and economic factors. Due to the importance of land planning, land management and biodiversity conservation, ecosystems need to be described, characterised and spatially located (Sims et al., 1996). Recently, ecosystem classification and mapping has received renewed attention, since its relevance for understanding ecological patterns and processes and addressing environmental tasks (Urban et al., 1987; Klijn & de Haes, 1994; Zonneveld, 1995; Metzger et al., 2005; Jongman et al., 2006). Factors controlling pattern can be used to recognize individuals (tokens), classifying types as well as mapping their boundaries (Bailey, 1996). Spatial structure of landscape elements is recognized as a crucial factor in affecting ecosystems functions (Forman, 1995; Turner et al., 2001) and its relevance is considered also in the international legislation. Recently, the European Landscape Character Assessment Initiative (ELCAI) represents the most important EU project for reviewing and documenting the state-of-the-art of landscape character assessment techniques in Europe (Wascher, D.M.,ed., 2005). Within this context, a project for mapping the landscapes of Italy at broad scales (1:500,000-1:1,000,000) was recently undertaken with the support of the Ministry of the Environment of Italy, in order to provide a reference model at national scale. Classification and mapping of landscape types was based on a hierarchical spatial framework developed by Blasi et al. (2000), that integrates the basic physical aspects of the landscape. The overlay of different environmental layers enables to define and map homogeneous

units of land characterised on climatic, lithological and geomorphological basis. The Climatic Regions have been derived from an existing map (Blasi & Michetti, 2005), while a review of the geological maps produced in Italy was necessary for the lithological final product and a new geomorphological map was realised using an innovative method for landform identification, classification and mapping (Guida & Siervo, 2007), in coherence with a new proposal of multi-scale geomorphological map legend (De Pippo et al., 2007). The Lithological Map was produced from a systematic reinterpretation and homogenization of preexistent regional and national geological units (i.e. Geological Map of Italy of National Geological Service) in term of multi-scale hierarchical lithological units (IAEG-UNESCO, 1976; Guida et al.,1994). The following lithological entities was thus recognized and mapped: System, at scale 1.000.000 to 1:250.000, for national analysis level, Complex, at scale 1:250.000 to 50.000, for regional level, and Unit, at scale 1:50.000 to 1:25.000, for local analysis level. The Morphological Map, instead, was achieved using a semi-automatic method from a digital elevation model with 75-m resolution and implementing a step-by-step procedure: i) basic morphometric analysis, ii) topographic position analysis; iv) grid-based neighborhood geomorphometric analysis, iv) object-based geomorphic analysis, and then, v) grid-to-vector translation and comparison with training areas maps carried out with the traditional geomorphological approach (Guida & Siervo, 2007). Each Landscape Types, obtained from progressive overlapping of the above themes, have been then analyzed and characterised in terms of potential natural vegetation and land cover, employing the 1:250,000 “Map of vegetation series of Italy” and the 1:100,000 CORINE Land Cover Map.