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# Hydrogeomorphological units at regional, basin and watershed scale from automated land-system recognition: GIS-based experiences in Campania Region (Southern Italy).

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The hydrological behaviour in large basins is controlled by complex interactions between geomorphic, hydrological, hydro-geological, biological processes and land uses practices in hillslope, small catchments, watersheds and riparian zones. Studies related to this topics must be carried out within on shared interdisciplinary approaches. Linkages between hydrologic behaviour and geomorphic-soil attributes influences nonlinear or threshold responses of the hydrologic functions as runoff generation from open hillslope and colluvial hollows, expansion of preferential flow networks, redistribution of subsurface water storage in soils (Sidle et al.,1999,Tsuboyama et al. 1998, 1999) and groundwater contribution from bedrock. Therefore, in the last decades geomorphometric classification methods have supported the hydrologic modelling at large to small scale. On a qualitative basis, it is well known that hydrologic processes are influenced by geomorphometric properties like local slope angle, convergencies or drainage density (Gregory and Walling, 1973). Recent advances in the analysis of landform geomorphometry through the availability of high resolution Digital Elevation Models (DEMs) and diffusion of GIS software enhance quantitative research efforts within this topic. In order to up-to-date the GNDCI-CNR project 'Flood Assessment' at regional scale, so called VAPI (Rossi & Villan, 1995), a new project with general aim to develop methods transfering hydrologic models and parameters in flood assessment at sub-regional spatial scales was undertaken. One part of this project concerns the definition and regionalisation of hydro-geomorphometric charac-

teristics in term of landform-soil relationship and attributes with hydrologic relevance on different spatial scales. In this paper preliminary results of this investigation are presented in order to define multi-scale geo-morphometric landform types, reflecting similarities in their soil-landforms relationship and hydrologic behaviour. use these parameters in the definition of areas showing similar hydrologic response by a simple hydrologic-geomorphometric landform classification, using a predefined model of terrain classification. Geomorphometric classification scheme follows the approach from White (2000), using the original algoritms proposed in Guida& Siervo (2007) and producing hydrologically effective landforms-soil units (HELSU) according to the basic runoff generation models: i) hortonian overland flow, ii) saturated overland flow, iii) subsurface flow and iv) deep percolation.