



## **A new Geodiversity Index as a quantitative indicator of abiotic parameters to improve landscape conservation: an Italian case study.**

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Landscape is one of the main economic and cultural resources of Italy because of the wide geological and environmental diversity that characterizes this country. The diversity of natural ecosystems is made up of biotic components (biodiversity) and abiotic ones (geodiversity). After the Rio Summit in 1992 (United Nations Conference on Environment and Development) the scientific community identified the natural variability with the diversity of the biological components. Only in recent years geologists and geomorphologists introduced the concept of geodiversity in the study of natural heritage as “the natural range (diversity) of geological (rocks, minerals, fossils), geomorphological (landform, physical processes) and soil features”. Later, the variability associated with topographic and hydrographic parameters has been introduced in the definition.

Up to now the researches focused on the definition, identification, study and development of geosites (“any place, area or territory where it is possible define a geological or geomorphological interest for preservation”). Such a trend naturally evolved to the development of areas characterized by a geological heritage with a high scientific and cultural value and with an administrative network for the improvement of economic strategies, useful for promoting and safeguarding a given site (Geoparks). In Italy, seven Geoparks are recognized by the World Geoparks Network established by UNESCO.

Despite the excellent results achieved by national and international teams, the issue of quantitative assessment of geodiversity is still a matter of debate and intense research. Further progresses need to be focused on quantitative models (from medium to small scale) by including the assessment of abiotic characteristics. They need to be based on quantitative estimates of geological components from a geometric point of view, rather than the semantic one. This can be done by applying Geographic Information Systems (GIS) for the natural analysis of the spatial relationships defining numerical indices. Several factors both with intrinsic spatial continuity (geological substrate, soil cover, land use) and with intrinsic spatial discontinuity (geomorphological processes) contributes to the definition of geodiversity. Such factors are often not available. In this work we propose an evaluation of a digital Index of Geodiversity (Geodiversity Index, GI) for the area of Euganean Hills Regional Park (Veneto Region, NE Italy), using a GIS-based analysis of DEM-derived factors, available for the entire Italian territory. Results are compared with geological and environmental features of the study area and efficacy and limits of the proposed method are discussed.