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## Water erosion and climate change in a small alpine catchment

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### WATER EROSION AND CLIMATE CHANGE IN A SMALL ALPINE CATCHMENT

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A change in the mean and variability of some variables of the climate system is expected to affect the sediment yield of mountainous areas in several ways: for example through soil temperature and precipitation peak intensity change, permafrost thawing, snow- and ice-melt time shifting.

Water erosion, sediment transport and yield and the effects of climate change on these physical phenomena are the focus of this work. The study area is a small mountainous basin, the Guerna creek watershed, located in the Central Southern Alps.

The sensitivity of sediment yield estimates to a change of condition of the climate system may be investigated through the application of different models, each characterized by its own features and limits.

In this preliminary analysis two different empirical mathematical models are considered: RUSLE (Revised Universal Soil Loss Equation; Renard et al., 1991) and EPM (Erosion Potential Method; Gavrilovic, 1988). These models are implemented in a Geographical Information System (GIS) supporting the management of the territorial database used to estimate relevant geomorphological parameters and to create different thematic maps.

From one side the geographical and geomorphological information is required (land use, slope and hydrogeological instability, resistance to erosion, lithological characterization and granulometric composition). On the other side the knowledge of the weather-climate parameters (precipitation and temperature data) is fundamental as well to evaluate the intensity and variability of the erosive processes and estimate the sediment yield at the basin outlet. Therefore different climate change scenarios were considered in order to tentatively assess the impact on the water erosion and sediment yield at the small basin scale.

**Keywords:** water erosion, sediment yield, climate change, empirical mathematical models, EPM, RUSLE, GIS, Guerna