



## **Geomorphological study of Magra and Vara rivers (Northern Italy) aimed to sediment management**

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The objective of this research project is to develop a methodology aimed to identify extent, severity and possible trends of instability processes (erosion, deposition) at the catchment scale, so to constitute a basic knowledge to support sediment management. The methodology is intended to be specifically suitable in the Alpine – Apennine context, where channels are typically characterised by a relatively high sediment transport, with a braided or wandering morphology. The expected result is the definition of an overall methodology, consisting in a series of integrated (hydraulic and geomorphological) modules for data collection, analysis and interpretation, that can be used by public agencies as a decision-making support for sediment management at basin scale.

The methodology includes three main modules:

- (1) Historical and recent channel changes, to identify past channel changes, areas of channel instability, types of adjustments, rates of channel migration, etc.
- (2) Sediment budgets, conducted by traditional hydraulic methods (based on standard sediment transport and continuity equations) combined with geomorphological methods based on quantification of channel topography variations (by photogrammetry and cross-sections).
- (3) Classification system of instability processes. This phase includes the following aspects: a) selection of a series of diagnostic variables for identification of the type of process; b) definition of a series of indices of erosion, transfer and deposition of sediment; c) development of a conceptual model of channel evolution specific for the two geographic contexts. Management and analysis of data is performed by GIS.