



Sediment budget of rivers at watershed scale: the case of Adige River

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The representation of the erosion and deposition phenomena needed a large-scale approach, that uses spatial step of hundreds of kilometers and temporal step of decades or centuries. This analysis requires the adoption of appropriate mathematical models to represent the dynamics of both liquid and solid fraction.

Here is presented a 1-D numerical hydro-morphological model, relatively simple as for the description of the water flow, but taking into account the non-uniform size of the sediments of rivers.

This model is applied to the Adige River, the second longest river of Italy (415 km), with a drainage area of about 12.000 km². This river is strongly influenced by the presence of different anthropogenic interactions that have modified the natural seasonal flows, and consequently the sediment balance and the morphology.

In the hydro-morphological model is also introduced a biological component which represents the response of different tree populations to the hydrological disturbances, in order to provide the distribution of vegetation in each cross section and properly correct the value of the sediment transport width of the river.

The model allows a comparative analysis of the main hydro-morphological changes occurred in the last century, as a result of a change in sediment and liquid flow input.