



Morphologies and hydrodynamic instabilities in the study case of Sinni river in Basilicata

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The aim of this work is to contribute to fluvial dynamics studies by proposing a method for morphologic and hydrodynamic catalogation of different typologies of river reaches, taking the Sinni river, a water course of the southern Appennino, in Basilicata region (Italy), as a study case. For this purpose, the energetic and geomorphologic classifications (Rosgen, 1996) were first applied and compared. The energetic classification allowed to subdivide the river in three macro-morphologies: incised river bed, that is the mountain reach of the river, with high slopes and large size river bed materials; alluvial river bed, that is the reach of the river that has obtained his feature because of alluvial processes; embanked river bed, the final reach of the river before arriving to the mouth. Rosgen's classification was applied at the first level of analysis and led to recognize different reach typologies at a large-scale (from Aa+ to G). Subsequently, a detailed study of every reach in which the river was been previously subdivided was carried out, further subdividing it recognizing the morphologies contained in the "Catalogue of fluvial morphologies and hydrodynamic instabilities" proposed by Copertino et al., 2009. River reaches catalogation was realized at a local scale, on the base of discharges measurements, topographical surveys, comparison of multi-temporal topographical maps, granulometric analyses of river bed material, measurements of stream velocity and sediment and trees logs transport, observation of river bed and banks vegetation. The multi-temporal analysis of some ortophotos, provided by the Basilicata River Basin Interregional Authority, was particularly useful in this phase. Starting from the pilot study curried out on the Sinni river, future developments of the research activity preview the catalogation of all the main rivers in Basilicata, the identification of the dominant fluvial processes and the design of a support informative system for river basin planning modelling.