

RIVER PLANFORM CHANGES DUE TO ANTHROPIC INTERACTIONS: A CASE STUDY

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In Italy the evaluation of the interactions between anthropic activities and fluvial morphodynamics, from a scientific or river basin management point of view, is an important legislative need. The paper proposes a quantitative evaluation of the meander planform changes of a reach of the Bormida river in Piemonte, in the northern part of Italy. By means of a compared analysis of historical maps (1853-2000), the planforms of the river have been analyzed and investigated by means of some morphological models proposed in literature. In particular the stability of the meander where the mining activity takes place has been investigated. First of all, the application of Langbein and Leopold's (1966) approach shows that the "sine generated curve" model fairly describes the river planforms (fig.1, 2, 3). The application of Ligeng and Schiara (1992) model shows that the actual morphological meander, without considering anthropic interventions, can be considered to be stable. By taking into account the floodplain lowering due to mining activity, the meander planform changes have been evaluated by means of the application of Langbein and Leopold's "sine generated curve" model, together with Odgaard's approach (Fig.4). The paper proposes a quantitative explanation of the occurred processes, and the effects induced by the anthropic mining activities have been put into evidence.

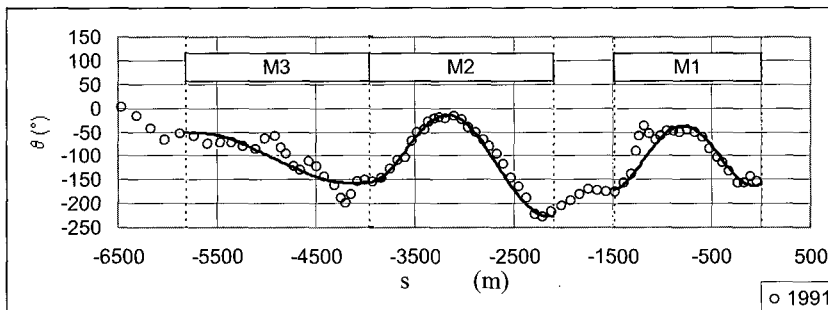


Fig. 1 Sine generated curve and $[\theta,s]$ couples for Bormida 1991 planform

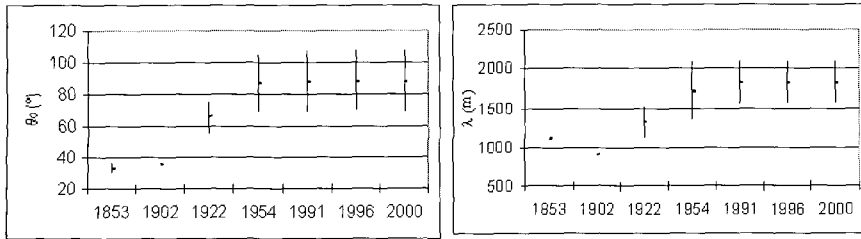


Fig.2 and 3 Variability in time of θ_0 and λ parameters, for M2 meander.

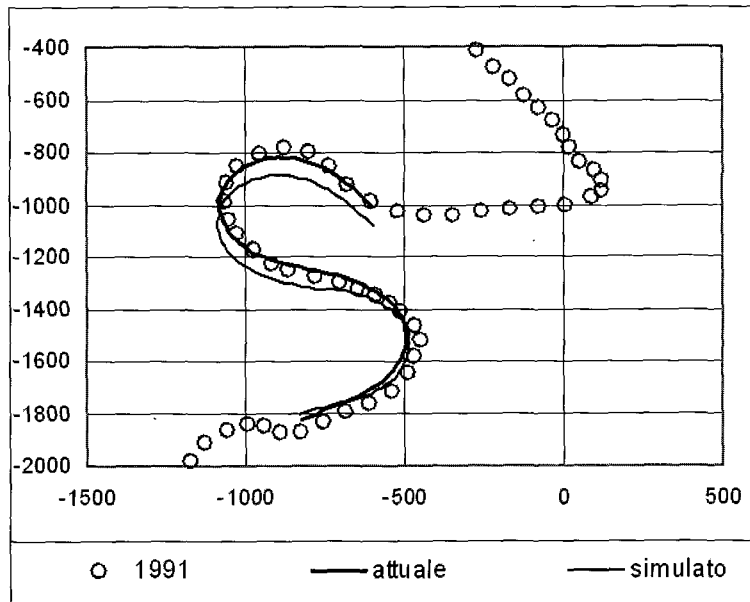


Fig. 4 Comparison between the actual M2 meander planform and the simulated one

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