



ICG2022-114

<https://doi.org/10.5194/icg2022-114>

10th International Conference on Geomorphology

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## Morphological changes and development of a channel evolution model upstream a dam

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This study describes the morphological changes occurring upstream a dam along a low energy alluvial river having cohesive banks, low bed slope, and high flow regulation within the catchment. Based on the observed changes, a channel evolution model is developed.

A multitemporal analysis of aerial photos and topographic survey comparison of the channel bed upstream a run-of-the-river dam along the lower Guadalquivir River (southern Spain) were used to document the morphological changes within a temporal interval of about 60 years and to derive the channel evolution model. For different cross-sections located along the reservoir channel, the trajectories of channel changes and the development of riparian vegetation were documented in relation to magnitude and frequency of floods and to the functioning of the dam.

Morphological changes mainly consisted of bed siltation and channel narrowing, terrace formation in the channel reservoir, and expansion of riparian vegetation. These changes induced significant effects on flooding of the adjacent alluvial plain, consisting of a reduction of the discharge necessary to start the inundation. Information on morphological changes in different locations along the reservoir within the investigated time interval were summarised by a space-for time evolutionary model consisting of a sequence of stages of channel evolution.