Geophysical Research Abstracts
Vol. 18, EGU2016-16038, 2016
EGU General Assembly 2016

Sea-floor undulations formation by turbidity flow in the Adra prodeltaic system, western Mediterranean Basin: comparison between numerical simulation and real data

Luis Miguel Fernández-Salas (1), Patricia Barcenas (2), and Jorge Macias (2)

(1) Instituto Español de Oceanografía, Centro Oceanográfico de Cádiz, 11006 Cádiz, Spain. Email: luismi.fernandez@cd.ieo.es, (2) Dpto. Análisis Matemático, Facultad de Ciencias, 29080 Málaga, Spain

Numerical simulation of turbidity currents are used to study the formation of the seafloor undulations in the Adra prodeltaic system, western Mediterranean basin. A series of elongated and subparallel bathymetric undulations are distinguished in the foreset-bottomsets domain of the Holocene pro-deltaic wedge associated with the Adra river. In this study, multibeam data and surficial sediment samples have been used in comparison with numerical simulation to propose an evolutionary model of the seafloor undulations. Numerical model suggests that the depositional basin slope gradient is one of the factors more influent in the seafloor undulations formation. The simulations allowed to observe as seafloor undulations are approximately in phase with the undulations of the turbidity layer. Therefore, undulations are associated with Froude-supercritical flow. The upslope and downslope undulations boundaries are limited by a hydraulic jump where the flow makes a conversion from supercriticial flow (Fr>1) to subcritical flow (Fr<1), respectively. The undulations axis are characterized by a point where Fr=1. The subcritical zone generates net sediment deposition and the supercritical zone produces erosion. This explains why seafloor undulations migrate upslope.

ACKNOWLEDGMENTS

This research has been partially supported by the Junta de Andalucía research project TESELA (P11-RNM7069)