

The evolution of the Guadalfeo submarine delta(northern Alboran Sea) during the last ca. 200 years

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The Guadalfeo submarine delta is located on the northern Alboran Sea shelf in the western Mediterranean Sea. The sedimentary dynamics of the deltaic system is governed by the discharge of one of the major rivers in this area draining the western sector of the near-coastal Sierra Nevada Mountains. The area is under the influence of a Mediterranean climate, with high spatial and temporal (i.e., inter- and intra-annual) rain variability. Major anthropogenic forcing affected the river system during the 1930's, with the deviation of the main river channel 2.5 km to the west, to its present position. More recently, the construction of Béznar (1977-1985) and Rules (1993-2003) dams have also contributed to limit the amount of sediments exported to the deltaic system.

In order to understand the interaction between river discharges and the evolution of the submarine delta at different timescales, sediment cores were collected off the ancient (core 13) and present-day (cores 12 and 15) river courses. A chronological framework was performed and combined with sedimentological and benthic foraminiferal analyses.

Radiocarbon dating of plant debris from the base of the cores indicates that the sedimentary record goes back 200 years. In core 13, the variations between coarse and fine fractions along the core and the upward increase of benthic foraminiferal population density, would indicate that deposition possibly occurred until the deviation of the main river course to its present position. In the lower part of core 12, the strong alternation between coarse and fine sediment textures and the variable amounts of benthic foraminiferal species are interpreted as the result of an active fluvial regime.

The upper part, with high percentages of fine sediments and high values of population density, could be attributed to the stabilization of the river course in its present-day location. Core 15, located at 11 m water depth, showed the highest content of gravel in the lower part of the core, high contents of silt at

two core depths and increased percentages of sand to the top, indicating the strong influence of human interventions in the river basin and consequent changes in the sediment supply to the Guadalfeo submarine delta.