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The impact of dams on the reduction of the sediment transports to the sea from core sample study in the Wadi Medjerda low valley

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The sedimentary contributions of the Medjerda to the coastal zone are poorly measured, and there is no chronicle of observations. In this context, the sediment monitoring appears indispensable for the quantification of sediment transport at the outlet. This study focuses on the largest watershed in Tunisia, the Wadi Medjerda (23600 km2). The main objective of this work is to assess the reduction of sediment transport following anthropogenic intensification, especially since the construction of many large dams. The impact of the water managements on sediment transport from the upper basins to the coastal areas may have strong and long-lasting effects on coastal geomorphology and ecosystems. In order to collect information on actual deposits over several years, the paleo-hydrological approach was applied through the study of sediment cores sampled in the low valley meanders on alluvial terraces, after the last dam (Sidi Salem, the largest water storage capacity over the basin), but before the estuary and near a hydrological station (Jedeida). The sedimentary deposits of the river provide key information on the past sedimentary inputs. A visible succession of sedimentary layers corresponding to the deposits of successive floods on the study site has been determined and the history of the sedimentary contributions of the Medjerda is reconstructed by this approach. The thickest layers of sedimentary deposits are related to exceptional events. They are mainly concentrated on the lower part of the core and are mainly composed of sands. The first 1.2 m of the core from the bottom upward relates to 10 years of river discharges, as can be determined from the Cs137 datation. The next upward meter of core relates to the following 20 years of discharges, up to 1982, date of the construction of the Sidi Salem dam. The last 80 cm of core near the surface is only composed of cleys with thin silt bands, and relates to a period of 32 years. We thus observe that there is no more sand deposits in the river bed since the construction of the Sidi Salem dam. The deficit of sediment supply to the sea is viewed as a major factor to be taken into account for better understanding of the dynamics of coastal areas in the context of global climate change.