

HISTORICAL CHANNEL CHANGES OF THE PARANÁ RIVER NEAR ROSARIO CITY (ARGENTINA)

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ABSTRACT

In this work, we analyzed the morphologic evolution of a reach 41 km long of the Lower Paraná River in front of Rosario City (between 447 km to 406 km of the sailing route). Cartographic materials at different scales, such as satellite images, air photographs and bathymetric charts recorded during the last 100 years, were used in the study. As part of the cartographic treatment, the records were digitized and geo-referenced. A common polygonal traced in all the records with sixty cross sections, allowed us different morphologic measurements to make of the channel geometry: surface area, channel volume, mean depth and widths; thalweg sinuosity and braiding parameters. Results showed reductions of the average width from 2,000 m at the beginning of the XX Century till to 1,600 m at present. The channel volumes changed differently: a decrease of 13% occurred till the sixties, followed by an increment to values similar to those of the XX Century beginning till nowadays. The consequence of these adjustments was increment of the channel mean depth during the last 30 years. The channel pattern also varied, the braiding parameter (s. Friend & Sinha) decreased from 2.28 to 1.43 until the fifties and then increased to 1.65 at the end of sixties. The last value remained nearly constant until present. The nature of these adjustments, shows that the Lower Paraná River had a different geomorphic evolution during the XX Century, compared with those reported for the Middle reach (1,240 km – 530 km of the sailing route) in the same period. In fact, the Middle reach adjusted varying (increasing – decreasing) mainly its mean width. The reasons of difference would be a complex combination of historical changes in the effective discharges and the reach location in the general context of the whole river. This implies that the studied reach would be a transition between the conduction zone (Middle Paraná) and the deposition region of the Paraná River near its mouth. The sediment transported by the river principally during the extreme flood events, would be temporary and partially stored in the transitional Lower reach. Consequently, the morphologic adjustments, when the effective river discharge varies, would not be the same that those recorded in the Middle reach.

Key Words: Channel changes, dominant discharge, morphologic evolution.