

Morphological Evolution along the North Part of Paraíba do Sul River Delta, Rio de Janeiro Brazil

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The morphological evolution of Deltas is determined by fluvial input and the hydraulic process (waves, tides and currents), reworking the sediments, forming a complex of different environments. The Paraíba do Sul Delta represents a example of wave dominated delta, where sequences of beach/foredunes ridges can be observed and describes different phases of deltaic sedimentation along the late Quaternary. In early studies, most of the authors focus in the Holocene evolution, which describes that the main process for the coastal evolution was linking by regressive trend of sea level, during mid-late Holocene, after maximum occurred in 5.300 B.P. Instead this previous works suggest that the inappropriate use of term Delta, because the role of fluvial input was not detected, in recent investigations proved that the sediment supply is the main source for the deltaic sedimentation. In this case the main objective of this work is understanding the mechanism for the formation and evolution of the beach/foredunes ridges, in the north part of Paraíba do Sul Delta, and the internal sedimentary structure. To reach these objectives we survey the submarine morphology along the delta front and the prodelta, using 10 bathymetric profiles across the coastline. We choose 3 bathymetric profiles and prolonged to the beach, to describe the topographic evolution connecting the beach and the shoreface. The internal structure was made by Ground Penetrating Radar profiles. The bathymetric profiles showed that, along of the delta front and the prodelta, sequences of submarine bars were gradually organized as one, by incident waves. The emergence bar migrates towards to the beach, identified by topographical surveys, by overwash process. Finally the emergence bar is connecting to the coast, and promotes the shoreline progadation by incorporation sequences of the ridges. The internal sedimentary structure, determined by GPR profiles, showed radarfacies associated of beach and shoreface patterns.

Geomorphic evolution of the Pinios River delta, in Central Greece, in the Late Holocene

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This study deals with the geomorphic evolution of the Pinios river delta, which is a late Holocene arcuate type delta, located in the southern Thermaikos Gulf (Central Greece).

This work has combined field geomorphological mapping with the study of the stratigraphy of Late Holocene deltaic sediments. A detailed geomorphic map at the scale of 1:5,000 has been prepared showing both the deltaic plain and the coastal zone features using GIS techniques. Comparative interpretation of aerial photographs taken in different dates and reliable maps of the last two centuries along with field observations depict recent changes of the delta morphology. Three boreholes reaching the depth of 4.5m were drilled with a portable drilling set. The stratigraphy of the late Holocene sediments was studied in detail and 40 sediment samples, collected from selected sedimentary layers, were analyzed using micropaleontological and granulometric methods while mollusc samples were dated using AMS radiocarbon method. The study of the stratigraphy of the Holocene deltaic sediments showed that during this period the sea invaded the area of the southern delta and created a shallow open marine environment which at times was disturbed by multiple terrestrial inputs induced by fluvial discharge and longshore drift.

Geomorphological mapping showed that among the most important factors for the recent development of the delta are fluvial sedimentation, wave activity and longshore currents. The dominant landforms in the deltaic plain is the numerous abandoned meandering channels and four generations of beach ridges through which the coastline has advanced during the late Holocene. Today the delta shoreline is generally retreating due to marine processes especially where former river mouths occur where retreat rates reach up to 4m/yr for the last 60 years.