

Internal Sedimentary Architecture and Coastal Dynamics as Revealed by Ground Penetrating Radar, Kachchh coast, Western India

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Abstract

The coastline constitutes a very sensitive geomorphic domain which is constantly subjected to dynamic coastal processes and stores vital information regarding past sea level fluctuations. A ground-penetrating radar (GPR) survey was carried out along the northern coast of the Gulf of Kachchh which is one of the largest macrotidal inlets of the Arabian Sea, Western India. Our studies have delineated several radar surfaces and radar facies which reflect the internal architecture and sediment body geometry, which can be related to the processes acting along this coastline. Various radar facies, namely, beach ridge (Br), washover (Wo), coastal dune (Cd), swale (Sw), berm plain (Bp), and sandsheet facies (Ss) have been identified. The GPR studies successfully documented the subsurface presence of ancient beach ridge system towards the sea, and the coastal dunes towards the land side. The results are suggestive of signatures of changes in sea level and the coastline being prone to high energy events in the recent past. The GPR has been found to be an important non-invasive geophysical tool in the study of past coastal dynamics.

Key words: ground penetrating radar (GPR), beach ridge, washover, coastal geomorphology, Gulf of Kachchh.