



Characterisation of intertidal surface sediments of the Western Abu Dhabi coastline

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The coastline of Abu Dhabi, lying on the southern shore of the Arabian Gulf, provides an ideal setting for studying sedimentation processes in an arid depositional environment that is directly analogous to that of many of the regions Mesozoic petroleum reservoirs. An understanding of this complex depositional system, based on quantitative sedimentological data, is crucial to the development of accurate depositional models and reliable simulations for carbonate reservoirs. The southern shore of the Arabian Gulf has an extremely low-angle ramp geometry with supratidal evaporite precipitation passing offshore, through a broad carbonate-evaporite intertidal setting with complex depositional facies geometries, into a subtidal carbonate depositional environment. The coast is locally protected from open marine conditions by a number of peninsulas and offshore shoals and islands.

This coastline is currently undergoing massive coastal infrastructure development on an unprecedented scale, with huge dredging and island building projects changing the dynamics of the coastline beyond recognition. The imminent loss of much of the natural coastal system gives further impetus to the need for accurately recording the natural sedimentary system before they it is obliterated by the anthropogenic overprint.

During this study we use multiple analytical methods to investigate and characterise the surface sediments of the intertidal zone of the Western Abu Dhabi coastline. Surface sediment sampling was undertaken at regular intervals along multiple transects through the intertidal zone along the coastline to the southwest of Abu Dhabi Island. Samples were returned to the laboratory for detailed sedimentological and mineralogical analysis to determine their textural and mineralogical composition.

The results of this study exhibit clear trends in the composition, grainsize and maturity of sediments within the current depositional architecture of the Abu Dhabi coastline. These trends allow us to establish quantitatively constrained facies geometries that can be applied when developing our understanding of sub-surface facies distribution and its control on reservoir development.