REMOTE SENSING OF COASTLINES IN SEMI-ARID ENVIRONMENT IN SOUTHERN ARABIAN GULF

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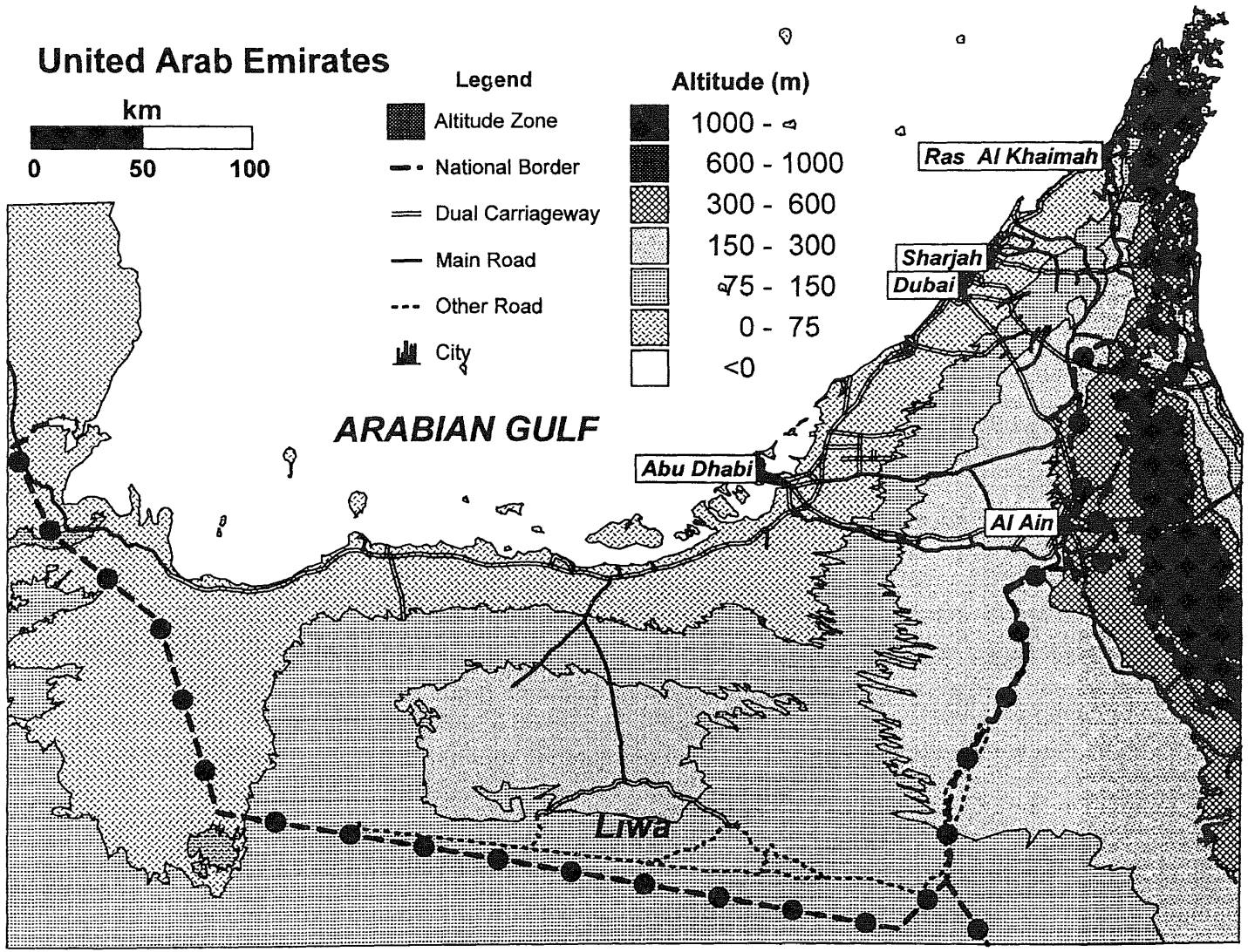
Different remote sensing technologies are presently used to map and assess coastlines in semi-arid environments in southern Arabian Gulf along the United Arab Emirates(UAE) coast. The lagoonal and coastal system has been classified and mapped for its bathymetric and geologic features using digital image processing technique. Dune ridges, alluvial fans, sbkha flats, algal mat beds, and mangroves associated with the tidal flats were identified and differentiated on a Landsat Thematic Mapper(TM) scene of the region.

The shallow subtidal to supratidal environments of the UAE coastal system have been extensively studied and is characterized by numerous sub-environments within the shallow subtidal, intertidal and supratidal zones. This semi-arid carbonate coastline and immediate offshore area of UAE are an important modern example of a complex interplay between carbonates, siliciclastics and evaporites and characterized by complex sedimentation along the Abu Dhabi coast is strongly influenced by an offshore barrier system oriented obliquely to the coastline into which it is progressively incorporated to the east. While the coastline extended from Dubai to Ras al Khamiah lacks an offshore barrier and, as a result, faces directly into the intense winds and maximum fetch of the Arabian Gulf which is marked by storm beaches, coastal dunes, and only local alongshore spit accretion. Sand dunes of the Arabian desert extend inland to the alluvial fans of the Oman Mountains.

In this study several pilot areas are selected in Abu Dhabi region and it is characterized by the following features. In eastern Abu Dhabi the Holocene coast trends northeast-southwest and the barrier/lagoon complex narrows. To the west, the protecting barrier islands are more widely spaced than those to the east. They occur on extensive sandy shoals and coral banks cut by tidal channels. The lagoon south of the barrier, the Khor al Bazam is a continuous open body of water. It has less restricted circulation than the lagoons to the northeast and at its western end it is connected to the Arabian Gulf. The distribution of the sediments reflects the above physiographic differences. to the east, oolites form on the inter-island tidal deltas and coral reefs are restricted to small patches. To the west, coral reefs grow along most of the

offshore banks to the north of the Khor al Bazam. Eastward of Dhabaiya, in the protected lagoons, carbonate muds and pellets are accumulating, whereas to the west of Dhabaiya, carbonate muds accumulate only in a narrow belt south of the offshore bank. Carbonate sands and skeletal debris are the dominant components. The entire province is undergoing constant change. The offshore bank is accreting seaward through the agency of coral growth and tidal delta formation. South of this bank, supratidal flats are encroaching on the lagoons with the development of beach ridges and algal flats. This interpretation of the different facies along the Abu Dhabi coast is not possible without a combination of field work and laboratory analysis accompanied by areal photographs and remote sensing maps.


United Arab Emirates
km
0
50
100
Legend
Altitude Zone
National Border
Dual Carriageway
Main Road
Other Road
City
Altitude (m)
1000 -
600 - 1000
300 - 600
150 - 300
75 - 150
0 - 75
<0
ARABIAN GULF
Ras Al Khaimah
Sharjah
Dubai
Abu Dhabi
Al Ain
Liwa