



The effects of recent sea level change on the carbonate ramp system of the Abu Dhabi coastline

S. W. Lokier and T. Steuber

Petroleum Geoscience Program, The Petroleum Institute, Abu Dhabi, UAE (slokier@pi.ac.ae)

The extremely low-angle carbonate-evaporite ramp system of the southern shore of the Arabian Gulf offers an ideal setting for studying the effects of relative sea-level fluctuations on sedimentary systems and shoreline morphology.

Our previous work on the sabkha system has established a Late Holocene progradation rate of 0.75 m/yr. By applying current estimates of global sea level rise, derived from satellite altimetry and tide gauges, we calculate present day marine transgression of the Abu Dhabi shoreline at a rate of 8.5 m/yr. We utilise multiple lines of evidence to test this hypothesised transgression, including; erosion of surface features (including microbial mats and hardgrounds), backstepping of facies belts and retrograding spits and beach ridges. The study area lies adjacent to the Al Dabb'iyah and Rumaitha Fields. Hydrocarbon production from these fields only commenced in 2000 so there has been insufficient time for significant extraction-related subsidence to take place. We establish the current depositional geometry of the Abu Dhabi coastline and place the current system within a sequence stratigraphic framework.

During transgression there will be a significant increase in energy regimes, this will result in the erosion of previously deposited sediments and will inhibit future sediment accumulation. We therefore propose that the present overall sedimentary regime of the Abu Dhabi coastline is one of erosion and associated shoreline regression with little sedimentation taking place at this time. As such, this would be recognised in the sedimentary system as an unconformity or flooding surface marking the onset of a parasequence.