Geophysical Research Abstracts
Vol. 20, EGU2018-1414, 2018
EGU General Assembly 2018

Carbonate facies distribution within arid mangrove systems

Stephen Lokier, Flavia Fiorini, and Weaam Al Odeh

Khalifa University of Science and Technology, Petroleum Institute, Geosciences, Abu Dhabi, United Arab Emirates (slokier@pi.ac.ae)

An extensive complex of natural and planted mangrove forests occurs along the Arabian (Persian) Gulf coastline of the United Arab Emirates (UAE). These mangals are much-cited as a recent analogue for Mesozoic formations from the Middle East. Despite this, there is very little documentation or understanding of the primary depositional facies of these coastal depositional settings. In particular, no attempt has been made to link the sedimentary facies, and their component biota, to water depth or energy regime. Such a paucity of data severely compromises palaeoenvironmental interpretations and the constraint of reservoir models.

With this in mind, we have undertaken an extensive sampling campaign in order to fully characterise the sediments associated within the depositional sub-environments of mangal systems. Historical satellite imagery, literature reviews and ground-based reconnaissance were used to identify a pristine natural mangal complex to the east of Jazirat al Sa'adiyat. Sampling stations were established along a topographically surveyed 630 m transect in order to record the range of environmental conditions, both in terms of energy and in relation to the degree of tidal exposure. An array of environmental parameters were monitored, these included, but were not limited to, temperature, salinity, current-velocity, dissolved oxygen and turbidity. The surface sediment at each sample station was subjected to a range of analyses including grain size and modal analysis, identification of biota and measurement of total organic content. Repeat sampling was employed in order to assess any changes in sediment characteristics related to seasonal influences.

This study establishes a strong quantifiable relationship between mangal sub-environments and sedimentary facies. This relationship can be utilised to develop a facies model that is predictive of the palaeoenvironmental setting of facies within ancient sediments inferred to have been deposited within similar coastal mangal systems. Consequently, the findings of this study will aid in the development of accurate petroleum reservoir models that are constrained by a quantitative data set.