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Paleo-shorelines along the Southeastern Part of the Arabian Peninsula

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Tracing paleo-shorelines development of coastal margins during the Holocene (last 10,000 years) is vital for assessing effects on ecosystems and hazards of seawater intrusion into coastal aquifers. A case study is presented here from the United Arab Emirates which occupies the southeastern part of the Arabian Peninsula with a coast of about 700 km long. The data reported here come from sites located at different distances from the present-day shoreline, which represent potential markers of Holocene sea level changes. The sedimentary sequence in these sites is dominated by muddy, sandy and gravelly carbonates with variable number of fossils such as molluscs, corals, foraminifera and microbial mats. The paleontological and sedimentological data and occurrence of evaporites reflect development in a low clastic input and warm hypersaline tidal flat and estuarine environment, typical of the UAE coastal area. At the same time the preserved texture of the shells and their intact form support in situ deposition. C-14 ages of selected fossils vary between 3136 and 6636 years BP providing a temporal picture of coastal development. These results suggest several fluctuations in Holocene sea level that can be linked to high sea level stand at different periods. Intrusion of the sea may have reached as much as 6 km inland during the dated period which may have occurred at the end of the Holocene climatic optimum. The results provide inference of a sea level rise as much as 5 m above the present-day sea level. The estimated absolute sea-level changes were complicated by the variable degrees of tectonic subsiding and uplift, which can be crucial for understanding extent of future sea-level changes in the region.