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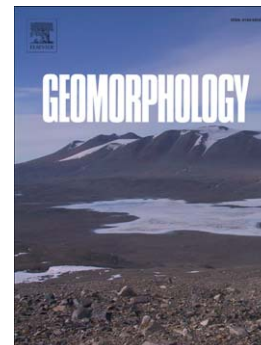
Implications of sea-level rise in a modern carbonate ramp setting

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Title: Implications of sea-level rise in a modern carbonate ramp setting

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Abstract

This study addresses a gap in our understanding of the effects of sea-level rise on the sedimentary systems and morphological development of recent and ancient carbonate ramp settings. Many ancient carbonate sequences are interpreted as having been deposited in carbonate ramp settings. These settings are poorly represented in the Recent. The study documents the present-day transgressive flooding of the Abu Dhabi coastline at the southern shoreline of the Arabian/Persian Gulf, a carbonate ramp depositional system that is widely employed as a Recent analogue for numerous ancient carbonate systems. Fourteen years of field-based observations are integrated with historical and recent high-resolution satellite imagery in order to document and assess the onset of flooding. Predicted rates of transgression (i.e. landward movement of the shoreline) of 2.5 m yr^{-1} ($\pm 0.2 \text{ m yr}^{-1}$) based on global sea-level rise alone were far exceeded by the flooding rate calculated from the back-stepping of coastal features ($10\text{-}29 \text{ m yr}^{-1}$). This discrepancy results from the dynamic nature of the flooding with increased water depth exposing the coastline to increased erosion and, thereby, enhancing back-stepping. A non-accretionary transgressive shoreline trajectory

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