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Estuarine development and early Holocene transgression across an aeolianite substrate, Caesarea, central Israel

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Abstract

Estuaries are important features on the coastal landscape due to their potential for rich, diverse, and abundant resources. The modern coast of the southeast Mediterranean is largely devoid of estuaries except in rare circumstances where ample sands are delivered to the shore, such as east of the Nile Delta. Whether or not today's condition is reflective of that present during lower sea-levels is greatly speculative in part due to a dearth of high-resolution sub-surface mapping in the shallower (<45m) continental shelf. We report here on a multibeam bathymetry and near-surface seismic stratigraphy survey offshore of Caesarea, along the central Israeli coast; within which we find evidence of preserved estuarine sediments in water depths ~45-10 mbsl, both within paleo-channels of the Crocodile and Hadera rivers, and more broadly across the shelf. These water depths correspond to early Holocene dates (~10.5-7.5 ka) which, based on global sea-level curves, was a period of rapid (~1-1.7 cm/yr) sea-level rise. Now-submerged aeolianite ridges (locally referred to as 'kurkar'), cemented aeolian deposits formed during pre-Last-Glacial-Maximum (LGM) seaward advance (regression) of the coastline, likely provided some offshore barrier for estuarine development. These were insufficient, however, to

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