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Anthropogenic Impacts on the End of a Sand Nourishing Littoral Cell- a Case Study from the Eastern Mediterranean

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Beaches are a dynamic environment that are morphologically affected by natural processes and, in many cases, by man-made changes. In unique environments such as the termination of a littoral cell, the disturbance in the natural sedimentary regime might have a greater effect on beach erosion, width and topography. The Israeli coast (Eastern Mediterranean Sea) is characterized by massive anthropogenic development. The coastline of Haifa Bay, the northern terminal depositional basin of Nile Delta derived sand, has undergone major developments in a relatively short time since it was settled in the beginning of the 20th century. The population in the bay has grown by more than 23 times in the past 100 years, and the urban and industrial areas have expanded accordingly on what used to be coastal dunes and sandy beaches. Ports and breakwaters were built, underground pipes were buried and removed, etc. After evidence for erosion of in the southern beaches, artificial sand nourishment was carried out in an effort to reconstruct the coastline of the bay. It is unknown how these man- made changes impacted the coast, its morphology and compositional character during the last century. The study examines the geomorphological changes that occurred in Haifa bay between 1918-2018. It relies on coastline change assessment based on fluctuations of the wet- dry boundary as seen in georeferenced aerial and ortho-photographs. Initial results show that the southern part of the bay is undergoing erosion, while the northern part is expanding. This and other results will be discussed.