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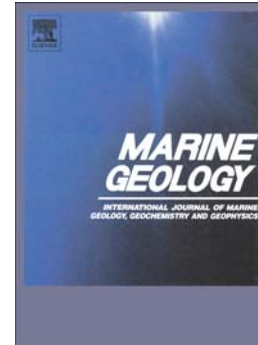
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Rafael J. Bergillos, Miguel Ortega-Sánchez, Gerd Masselink, Miguel A.
Losada

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Morpho-sedimentary dynamics of a micro-tidal mixed sand and gravel beach, Playa Granada, southern Spain

Rafael J. Bergillos^a, Miguel Ortega-Sánchez^a, Gerd Masselink^b, Miguel A. Losada^a

^a*Andalusian Institute for Earth System Research, University of Granada, Avda. del Mediterráneo, s/n, 18006, Granada, Spain*

^b*School of Marine Science and Engineering, Plymouth University, PL4 8AA, Drake Circus, Plymouth, UK*

Abstract

This paper addresses the changes in the morphology and sedimentology of a micro-tidal mixed sand and gravel beach (Playa Granada, southern Spain) forced by wave and water-level variations, and human intervention through nourishment. Monthly and storm event-driven beach surveys, consisting of topographical measurements and sediment sampling in two selected areas, were carried out over a one-year period. Three prevailing sediment fractions (sand, fine gravel and coarse gravel) and two end-member morphological states of the upper beach profile (convex with multiple berms and concave with a single storm berm) were identified. Between them, several transitional profiles were formed, characterized by developing berms that progressively overlapped, generating sediment variability both across the beach profile and with depth. The results indicate that the total run-up (including water-level) reached during an event represents a more accurate threshold for differentiating between erosional and depositional conditions than wave height. They also suggest that mixed sand and gravel beaches recover faster from storm erosion than sandy beaches. The long-term benefit of the artificial nourishment that took place at the end of the

*Corresponding author.

E-mail address: rbergillos@ugr.es (R.J. Bergillos)

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