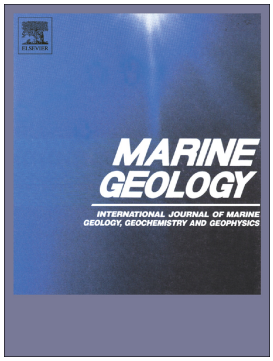

Pocket beach sediment: A field investigation of the geodynamic processes of coarse-clastic beaches on the Maltese Islands (Central Mediterranean)

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PII: S0025-3227(17)30052-X
DOI: doi: 10.1016/j.margeo.2017.02.011
Reference: MARGO 5588

To appear in: *Marine Geology*

Received date: 29 August 2016
Revised date: 29 January 2017
Accepted date: 17 February 2017

Please cite this article as: Sephora Sammut, Ritienne Gauci, Aldo Drago, Adam Gauci, Joel Azzopardi , Pocket beach sediment: A field investigation of the geodynamic processes of coarse-clastic beaches on the Maltese Islands (Central Mediterranean). The address for the corresponding author was captured as affiliation for all authors. Please check if appropriate. Margo(2017), doi: 10.1016/j.margeo.2017.02.011

Pocket beach sediment: A field investigation of the geodynamic processes of coarse-clastic beaches on the Maltese Islands (Central Mediterranean)

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Abstract

Research on pocket beaches is scant, and merits impetus for further investigation in view of the importance of coastal landscapes in Mediterranean countries. This paper is a first as a geomorphological study of pocket coarse-clastic beaches in the Maltese Islands, shedding light on beach sediment dynamics and related spatio-temporal controls between and within beaches. Four beaches along the coastline of the Maltese Islands were selected as study areas, with distinct geological lithologies, coastal configurations and variable wave exposures. Systematic sampling and field data were collected on beach morphology, sediment size and shape properties to account for both seasonal and post-storm trends. Sediment tracer experiments were also carried out to determine the major transport pathways and recoveries of gravel beach sediments. Wave exposure, geological background and coastal configuration were found to be important components in coarse-clastic pocket beach behaviour. This study re-affirms that microtidal pocket beaches constitute individual environments, which require a rigorous and representative systematic sampling approach based on sediment behaviour in both the longshore and cross-shore dimensions. The results of this study call for the need to investigate further different spatio-temporal processes operating on microtidal pocket beaches and their role in understanding the dynamics of sediment behaviour.

Keywords – pocket beach, coarse-clastic, gravel, sediment, spatio-temporal scales, storms, Maltese Islands

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