



Nearshore wave modelling in pocket beaches: Adoption of SWAN model approach for sediment tracer studies on the Maltese Islands (Central Mediterranean)

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The aim of the investigation was to assess the mechanisms of sediment transport in coarse-clastic beaches at different temporal scales, and the response of sediment displacement to incoming wave conditions. Sediment tracer studies were conducted in four microtidal coarse-clastic pocket beaches in the Maltese Islands, with variable geological lithologies, coastal configurations and exposures. Recoveries of the sediment tracers were carried out twice at each study area to account for two temporal levels, hours and days. Since direct measurements of wave conditions are absent in the Maltese Islands, a validated Simulating Waves Nearshore (SWAN) modelling approach was implemented to hindcast the nearshore hydrodynamic conditions, both offshore and inshore of the study areas during the tracer experiments. Nearshore bathymetry, coastal configuration and the dominant wave direction were found to be important components in the displacement of sediments. The embayed nature of the four beaches also controls the prevailing directions of sediment transport, affirming the need to study pocket beaches as individual coastal settings.