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Coastal geomorphological study of pocket beaches in Crete, with the use of planview indices.

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The formation of pocket beaches is a result of a large number of processes and mechanisms that vary on space and time scales. This study aims in defining the planform characteristics of pocket beaches in Crete Isl. and to determine their sheltering effect, embaymentization and their status of equilibrium. Thus, data from 30 pocket beaches along the coastline of Crete, with different geomorphological and hydrodynamical setting, were collected. Planform parameters were applied and coastal planview indices from the bibliography were applied. The parameters included: length and orientation of the headlands between the pocket beach; length between the bay entrance and the center of the beach; lengths of the i) embayed shoreline, ii) embayed beach, iii) beach segment located at the shadow of a headland; linear distance and orientation between the edges of the embayed beach; direction of the incident wave energy flux; wave crest obliquity to the control line; beach area, maximum beach width and headland orientation and river/ torrent catchment areas in beach zones that an active river system existed (Bowman et al.2009).
For the morphological mapping of the study areas, 1:5000 orthophoto maps were used. Wave regime has been calculated with the use of prognostic equations and utilising local wind data (mean annual frequency of wind speed and direction), provided by the Wind and Wave Atlas of the Eastern Mediterranean Sea. The diffraction and refraction of the waves has been simulated with the use of numerical models.
The study shows that Cretan pocket beaches display a wide range of indentation, suggesting that is the result of several parameters that include tectonics, coastal hydrodynamics and river catchment areas. The more indented bays are, the shorter their beaches become, while low-indented pocket beaches are the widest and the longest ones. Beaches with headland with large length appear to be more protected and receive smaller amount of wave energy. Most of the Cretan pocket beaches have limited sediment supply for the mainland, while they appear to be in an unstable status.

D. Bowman, J. Guillén, L. López, V. Pellegrino (2009), Planview Geometry and morphological characteristics of pocket beaches on the Catalan coast (Spain). Geomorphology, 108, 191–199