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Development of a Coastal Inventory in Greece

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Greek coastline that accounts more than 16.000 km hosts hundreds of beaches, which constitute a great touristic destination. However, no gathered information exists relative to its qualitative and quantitative characteristics (e.g. physicogeographical characteristics, artificial structures, nearby land use). Therefore, the development of a coastal database that would successfully concentrate all relative data, in the form of a National Inventory, could be a valuable tool for the management and the sustainable use and exploitation of beaches and the coastal zone.
This work presents an example of the development of a beach inventory in the case of the beach zones of Heraklion and Lassithi counties in the Island of Crete, which is one of the most touristic areas in Greece.
Data were initially abstracted from satellite images and combined with in situ observations carried out along 98 beaches with shoreline length >100 m. The collected data included geomorphological, topographic and bathymetric mapping, sediment sampling from the subaerial and underwater part and recording of artificial structures.
The initial mapping showed that beaches represent only the 18%, with 74% of the total coastline to be rocky while 8% of the coastline host some kind of artificial intervention. The combination of satellite and in situ mapping led to the development of a coastal geomorphological map. Beach widths were found to be limited with the majority of beaches (59%) to have maximum widths less than 25 m, 35% to range between 25 and 50m and about 6% with maximum widths >50m. Concerning beach length, the threshold of 1000 m is overcome only by the 46% of the beaches. Beaches with very smooth slopes (<2.5) are infrequent (∼6%), whilst beaches with low slopes (2.5-5%) are the majority (42%) along with beaches with moderate slopes (5-7.5%) that account approximately the 32%. Beaches with high slopes (7.5-10%) are about 11%, whereas very high slopes and extremely high slopes are much less being equally to 6% and 3%, respectively. With respect to beach position, the majority of the south beaches are characterized by slopes of 5-7.5%,, whilst most of the north beaches present lower slopes in the order of 2.5-5%. In terms of sediment texture, 41% of the beaches were found to consist mostly of medium and coarse sands (gS and (g)S) and 31% of gravels with some sand presence ((s)G and sG). The exclusively sandy beaches correspond to the 11% when the exclusively gravelly beaches accounts for 16%. North sided beaches were found to be more fine grained compared to the south beaches; this most probably is due to the more persistent wave regime.
The main human interventions along the coast of the study area are associated with four main ports (Heraklion, Ag. Nikolaos, Sitia and Ierapetra) and twelve small fishing ports (twelve in the north, one in the east and eight in the south), coastal residential and touristic development, coastal protection works and river management schemes.

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