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The impact of coastal interventions: between the myth and the reality

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The human interference within the coastal zone is usually associated with negative impacts, such as promoting or accelerating coastal erosion. This perception results from the innumerous cases worldwide where the artificialization of large stretches of coastline, with the loss of irreplaceable natural values, was unable to solve the background erosional problem. This idea, is so deeply rooted, that all human interventions at the coast are generally seen as, a priori, negative, disregarding their possible benefits. This can constitute an obstacle to an integrated coastal management approach, which should consider not only the environmental issues, but also social and economic dimensions.

This work focuses on the importance of understanding how coastal interventions can upgrade the value - in a wide sense - of a coastal stretch. These interventions should rely upon not only in-deep scientific/technic knowledge of the littoral system (including the sedimentary dynamics and budget) but also consider the existing anthropic footprint.

The study area comprises the Portuguese Sunshine Coast (Costa do Sol) - extending from Cascais to S. Julião da Barra - a sand starving littoral characterized by low height cliffs and narrow pocket beaches. This is a cosmopolitan coastal area with a high touristic demand. The shoreline is presently heavily engineered with coastal structures, aiming coastline protection and recreation purposes.

The analysis of aerial photographs, cartographic maps and iconographic elements, from the beginning of the 20th century to the present, allowed to deduce shoreline evolution and to assess coastline artificialization, materialized by the construction of coastal promenades, short groins, seawalls and localized, short-sized, beach nourishments. From this study it was possible to identify significance changes in shoreline position, with alternating accretion and erosion episodes, but without a perceptible trend. However, it was not possible to relate shoreline changes with the increasing human intervention, except updrift of groins where small beaches developed – Moitas, Tamariz and Avencas beaches. Results also suggest that the coastal development did not lead to the reduction of the already deprived littoral sedimentary budget but, on the contrary, it contributed to a localized increase in beach area.

Human intervention in coastline is still a controversial subject. The errors made in the recent past led to a shift of the coastal management paradigm from human-centered to a conservationist approach. The latter is supported by the precautionary principle which advises not to interfere with the system if there is a possibility to get an unforeseen negative feedback of the intervention. However, this approach can have some serious drawbacks since is unable to solve some of the most urging problems in the coastal zone, namely, those related with the accessibility and fruition of the beach environment. These aspects are particularly critical in highly demanding areas, where beach carrying capacity is already exceeded.

In this study, we show that coastal development does not have to be synonymous of beach degradation; instead, in this particular case, it was responsible for a localized increase of the beach caring capacity, which was achieved without prejudicing the sedimentary budget along the entire sedimentary cell.

This work contributes to put in perspective the role of human-induced interventions as a major driver of coastal evolution. In this context, the major risk of any coastal manager is to blindly follow a type of coastal intervention which is politically correct at a certain time-window; past experiences have shown that either human-centered (targeting problem solving) or conservationist (targeting problem avoiding) approaches should not be regarded as universal - the solution should always reflected a compromise between these approaches.