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FORUM

Morphodynamic responses of nourished beaches in SW Spain: A reply to Anfuso et al.

Muñoz-Perez, J.J.[1]

[1]*Coastal Department, Ministry of Environment, Marianista Cubillo n. 7, 11071 Cadiz, Spain; E-mail juanjose.munoz@uca.es*

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Introduction

Throughout the 1990s, the Coastal Directorate, presently subordinated to the Spanish Ministry of Environment, has realized an important campaign to renourish many of the beaches in Spain. This campaign has been designed not only to protect existing infrastructures on the coastline, but also to maintain the quality of the beaches *per se*. This is due to the widespread impact that tourism has on the Gross National Product (Houston 1995, 1996; King 1999). Special mention should be made of the fact that responses of renourished beaches were closely monitored until a political decision considered that further monitoring was not necessary. Transverse bathymetric profiles were established at 100-m intervals. These were surveyed biannually and, as a minimum, for two years after the nourishment was completed. Fortunately, currently and guided by scientific objectives, the Coastal Directorate has decided that these coastal measurements should continue.

Discussion

In relation to the beach nourishment programme, the excellent paper by Anfuso et al. (2001) has made a positive impact. The methodology used, based on monthly beach profiles, does not, however, provide data on the behaviour of submerged profiles (without doubt due to insufficient funding). Nevertheless, this work introduces new information on the short-term variability of the emerged profile. A data gap (which never should have been produced to begin with) has been filled, and a complete series of interesting conclusions has also been reached. Nevertheless, with a totally constructive intention, certain comments should be highlighted in order to defend the point-of-view adopted by those in charge of beach nourishments.

1. Sand was poured only on the emerged beach to create a wide berm with the intention of meeting the expectations of the tourist sector, at least for one summer season. This was criticized in the paper.

2. Before initiating each nourishment, bathymetric levelling, biological and littoral dynamics studies were carried out. Such studies were only excluded in emergency cases.

3. The authors appreciated the greater erosion on the nourished beach foreshore versus the natural one and presented an explanation based on the different slopes on the intertidal zone. Perhaps, the existence of a greater porosity in the slowly settled sediments as a consequence of pouring, compared with the porosity found once the beach sediments have been remobilized by a heavy storm, could be considered as well.

4. Anfuso et al. (2001) concluded that "some of the nourishments were not successful and others even have completely failed" . Eventually, as far as this conclusion is concerned, Muñoz-Pérez et al. (2001) reached a similar conclusion after measuring numerous emerged and submerged profiles based on different bathymetric monitoring. In the before-mentioned case, the suggested explanation was that the increase in the erosion rate was due, at least for reef-supported beaches (Muñoz Pérez et al. 1999), to the pouring of sand volumes much greater than the natural erosion rate.

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