Geophysical Research Abstracts
Vol. 17, EGU2015-2357, 2015
EGU General Assembly 2015

The mediterranean coast of Andalusia (sw spain): the impacts of human coastal structures

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Spanish coasts, especially the Andalusia Mediterranean one, were affected over time by progressive urbanization and associated construction of defense structures. Such structures protected small coastal sectors but at places triggered processes of coastal erosion and associated degradation of habitats and ecosystems. A correct management of coastal areas must be based on the monitoring of coastal evolution and human pressure. A useful tool to evaluate the level of human anthropization is the estimation of the "Coastal Armouring", e.g. the quantification of coastal defense structures, infrastructures, ports, etc.
In this study, available aerial photographs and satellite images from 1956 to 2011 were scanned and geo-referenced and used for the quantitative assessment of coastal human constructions impact on the studied coastal area. The so called coefficient of technogenous impact (K) was used. It results from the relationship between the total length of all maritime structures (groins, moles, seawalls, dikes, channels, etc.) and the entire length of the study coastal section. For this purpose, the Andalusia coast, about 500 km in length, was divided into sections of 1 km. For each one of such sections the technogenous impact was calculated in the 1956 and 2011 documents.
The analysis showed that the degree of anthropization in some areas (for example the Port of Montril) has increased considerably, triggering degradation processes in the nearby coastal areas. Results also evidenced as, in many cases, greatest human impacts are linked to the progressive construction of coastal defense.
The lack of a general strategy to combat the erosion problem and the urgency in the short term to protect specific parts of the coast led to a reactive approach based initially in the construction of hard structures. Such interventions locally solved erosion problems but gave rise to drowndrift erosion according to the “domino” effect. A more general management plan is needed, essentially based on the by-pass of ports and harbors and beach nourishment works.
Keywords: coast, coastal structures, coastal armouring, shoreline.