

# MORPHOLOGY AND EVOLUTION OF COASTLINES AND SEABEDS

Coastal areas are the most inhabited zone around the world where social and economic interests are increasingly concentrated. During the last tens of years, the construction of river dams and the dredging of riverbeds have prompted, along the coast, a strong decrement of sediment supplies resulting in intense erosive processes. Moreover, in the framework of the greenhouse effect and sea-level rise, coastal zones are strongly subject to drastic and fast changes. These changes are especially evident, because of their low-slope degree, in sandy coasts where the danger of coastal submersion is increasingly close. Finally, warming of temperatures have serious impact on ecosystems.

Within this worrying scenario the session "Morphology and evolution of coastlines and sea-beds" collect nine research articles. Eight are case studies coming from Italy, Spain Greece and Croatia while one is a research-review within the Mediterranean area.

The review in the Mediterranean area (*E. Anthony*) consists of the analysis of the continuity of flux sediment along the coast and river and how this has been interrupted, or strongly modified, by human activity. The intense fragmentation of flux, even more so in the context of climate change and sea-level rise, needs, according to the author, in an urgent effort to be re-established.

*D'Ascola et al.*, along the coast of Castiglione della Pescaia, provide an example of the application of a method based on the utilization of the geo-database "Linea di Costa" performed by ISPRA. The authors underline how this procedure represents a simple and easy method for specialists and stakeholders to obtain both a quick framework of the current stage of the coastline along with its evolutionary trend in terms of erosion and accretion.

*Lupicchini et al.*, proposed an innovative method to obtain shoreline identification using the topography, achieved from unmanned aerial vehicle (UAV) images. The authors have utilized the new approach along the strand-plain north of the Arno River that is currently affected by strong erosive processes. The comparison with the results obtained for the same stretch of coast through the classical methods of shoreline identification, based on topography, has allowed to evidence of the advantages of the new method.

The erosion process affecting the highly anthropized area of Porto Cesareo, located in a Marine Protected Area of the Gulf of Taranto (Puglia), is analyzed by means of an interdisciplinary approach by *Picciolo et al.*. Besides the typical approach based on the analysis of the aerial photogrammetry and satellite images,

they also utilized underwater archaeological markers to identify and date the ancient paleo-shoreline.

Three study cases are from Spain. *Arriola Velasquez et al.* propose a study based on the use of radionuclides as tracers of marine sediment movement along the beach La Canteras located in Las Palmas de Gran Canaria. The data acquired, developed using statistical methods, show the influence of wave action in their concentration. The authors point out the effectiveness of this methodological approach and its reproducibility for other coastal zones.

*Pagan et al.*, apply the Remotely Piloted Aircraft System (RPSA) and the Structure for Motion (SfM) image base computing techniques, to study both the dynamics of coastal dune systems and the coastal erosion process occurred along the Guardamar beach (Guardamar del Segura). The result shows how this low-cost approach is adequate for monitoring the evolution of the coastal zones characterized by the beach ridge systems.

*Lopez and Pagan* present a study on textural sediment analysis of the coarse sand feeding performed at Los Locos Beach (Torrevieja). This beach is instead naturally characterized by fine sand. The study shows how after a short period (15 months) the dumped coarse sands, as a result of wave movement work, became increasingly similar to those natural.

Finally, *Vandrakis et al.*, present a geomorphological approach to study, along the coast of Schinias - Marathon National Park (Attiki Greece), *Posidonia* Banquetts and their influence on coastal evolution and morphodynamics. The acquired data have demonstrated how the accumulation of *Posidonia* plays a significant role in the partial contrast to the erosive processes.

Also the study of *Pikely et al.* focuses on the theme of *Posidonia*. The authors analyze the effects of the continuous removal of *Posidonia* accumulations on the beach of Sakarun (Croatia), highlighting how this can determine a sedimentary deficit on the beach.

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