



Combination of Large-scale and Local Shoreline Change Studies for Hormozgan Coastline and Qushm Island at the Northern Persian Gulf

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Abstract

Prediction of accretion and erosion and coastline change are essential for a shoreline management plan (SMP) and to support decision making in Integrated Coastal Zone management (ICZM). The study for this purpose mostly includes the large or regional scale study; however the local or intermediate-scale study for engineering applications is also included. Organization of the study is therefore vital; whereby the balance between the coverage and accuracy is accomplished and sufficient details for diverse applicants are provided. This paper provides the overview of the approach applied to combine two scales of the study for prediction of shoreline evolution in long shoreline of Hormozgan and Qushm Island. The study is outlined in three levels, to logically deal with different scales of the work in terms of coverage, tools, applications and required accuracy of the outcomes for both managerial and engineering applications.

Introduction

Understanding coastal processes, prediction of accretion/erosion and assessment of resulting coastline changes are essential for a shoreline management plan (SMP). The provided information act as benchmark for evaluation of social, environmental and economic consequences, allowing the technical viability and sustainability of a range of management options within the framework of an Integrated Coastal Zone management, ICZM [1].

Coastal morphology is the result of a complex multi-scale dynamic process that involves waves, currents and sediment transport in interaction with the changing topography [2]. These processes have medium and large-scale components with lengths of the order from hundreds to thousands of meters and period of yearly and decadal. However, many coastal authorities prefer to include within the study, the influences of coastal processes for engineering applications specifically on the long term operation of existing coastal facilities. This more detailed study is at the same time-scale but at spatial scale of 1-3 kilometers [3]. Therefore, when the study is defined to provide background information and support for managerial decision making, most of the time the scope of the work includes combination of both levels of study.

Obviously, these two levels of studies incorporate different approach, tools and applications which are fully interconnected to each other [4]. Hence, a well-designed and clear plan to cover all managerial requirements and to observe the considerations, limitations and the level of precision of each scale of the study are of major concern. This paper provides the overview of