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Coastal dynamics in western Sicily

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The study of the evolution of the beaches plays a fundamental role in every territorial politics regarding the coastal band. More than half the world population lives in coastal regions which support a florid touristic activity in many countries. The beach constitutes, in terms of economic value, the most important element of the coastal system, but also the more fragile and morphologically variable. Thus, studying its evolutions is fundamental in order to adopt the best management of this complex, densely populated and economically interesting zone. In this regard, the western coast of Sicily (Italy) is an effective example. It took its origin from variation of the sea middle level (Quaternary), with the consequent formation of marine terraces. Morphologically, the shore is made up by low and rock coast alternating beaches. The historical evolution of the coast has been performed through the use of aerial images identifying, despite several uncertainties, the position of the shoreline. Indeed the shoreline position extracted from an aerial image is a wet/dry line that describes the instantaneous land-water boundary at the time of imaging rather than a “normal” or “average” condition. Each wave instantaneously influences the shoreline position and hence, to take into account shoreline oscillations due to wave motion. Even if from a conceptual point of view the shore line is defined as a border between the emerged earth and the sea, its perennial variability makes it difficult to determine.
In order to start a correct management, a cognitive geomorphological study has been carried on, as well as a study of high strategic value and environmental sustainability. It was based on a continuous decisional process based on objectives defined by the UE, in order to classify the beaches and to define the characteristic which are necessary for a correct coastal management. This study has been fundamental to start a monitoring of the coast; moreover, it has shown vulnerabilities of the coastal band which are important to design plans of defense.
Keywords: coast, shoreline, management