

RECENT EVOLUTION OF THE BEACHES OF THE GULF OF LERICI (LA SPEZIA, ITALY)

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Abstract

The aim of this work is to verify the impact of the new pier of Lerici harbour on the nearby beaches. During the summer '90 and '96, bathymetric and beach profiles were executed and compared. Sea bottom and beach sample sediments were also collected to determine textural characters. The results show a seaward movement of the isobaths with the increase of the sedimentary material. Erosional processes, in addition, do not seem relevant on the nearby beaches.

Key-words : *Thyrrhenian Sea, bathymetry, coastal management, shoreline evolution, sediments*

Introduction

In this paper we show the results of the analysis carried out on the beaches of the Comune di Lerici, which was part of a periodical research project run by the research centre ENEA in the structure of S. Teresa. This project had the aim of evaluating the changes of the coastline caused by different constructions along the seafront. In particular the lengthening of the pier in Lerici which was built in 1950 and lengthened by about 60 metres at the end of the 1980's, was investigated.

The study was focused in the morphological, sedimentological and textural characteristics of the beaches and the sea bed. It was conducted using topographic and bathymetric surveys and about 60 samples of sediment from the shore and the sea bottom.

Characteristics and general conditions of the coast

The coastal area examined is situated on the eastern promontory of the Gulf of La Spezia and is bounded by the Punta di S. Teresa in the NW and the promontory of Maralunga in the SE (Fig.1). The area is mainly a high coast characterised by small pebbly pocket beaches (1). Along the coastline there are also some parallel defense structures, at Venere beach, which has more than once in the past almost been completely eroded away especially after the construction of the pier at S. Terenzo and the Lido groins, which trapping the sediment, prevent the redistribution in the adjacent beaches. The area has been generally developed in the urban but especial-

ly touristic field. In the gulf there are two small harbours: at S. Terenzo for mooring small touristic boats and at Lerici for both tourist and fishing boats as well as commercial boats travelling between the islands of the Gulf of La Spezia.

Analysis of the variations in the shoreline

The comparison between variations in the morphology of the shore during the period from 1973 to 1996, was carried out using two different procedures. Comparisons of aerial photographs to reconstruct the last twenty years and topographic measures taken directly from the beach to compare the current shape to that observed in 1990.

From the morphological and morphometrical studies it was seen that the beaches can be subdivided, either by the geomorphological characteristics or the results of the textural analysis, into two groups. The first group consists of the beaches known as "pocket" the Baia Blu, Marinella and Colombo and the second group the beaches of S. Terenzo, Venere and the Lido (Fig.1). All of the beaches belonging to the second group show a progressive advancement in the shoreline. The advancement of the beaches of Venere and S. Terenzo is recorded as having started in 1973 while for the Lido there was first a regression before the advancement.

Marine hydrology and wave dynamics

Inside the Gulf of Lerici the currents moves in anti-clockwise direction in accordance with the general movement of the water mass which come

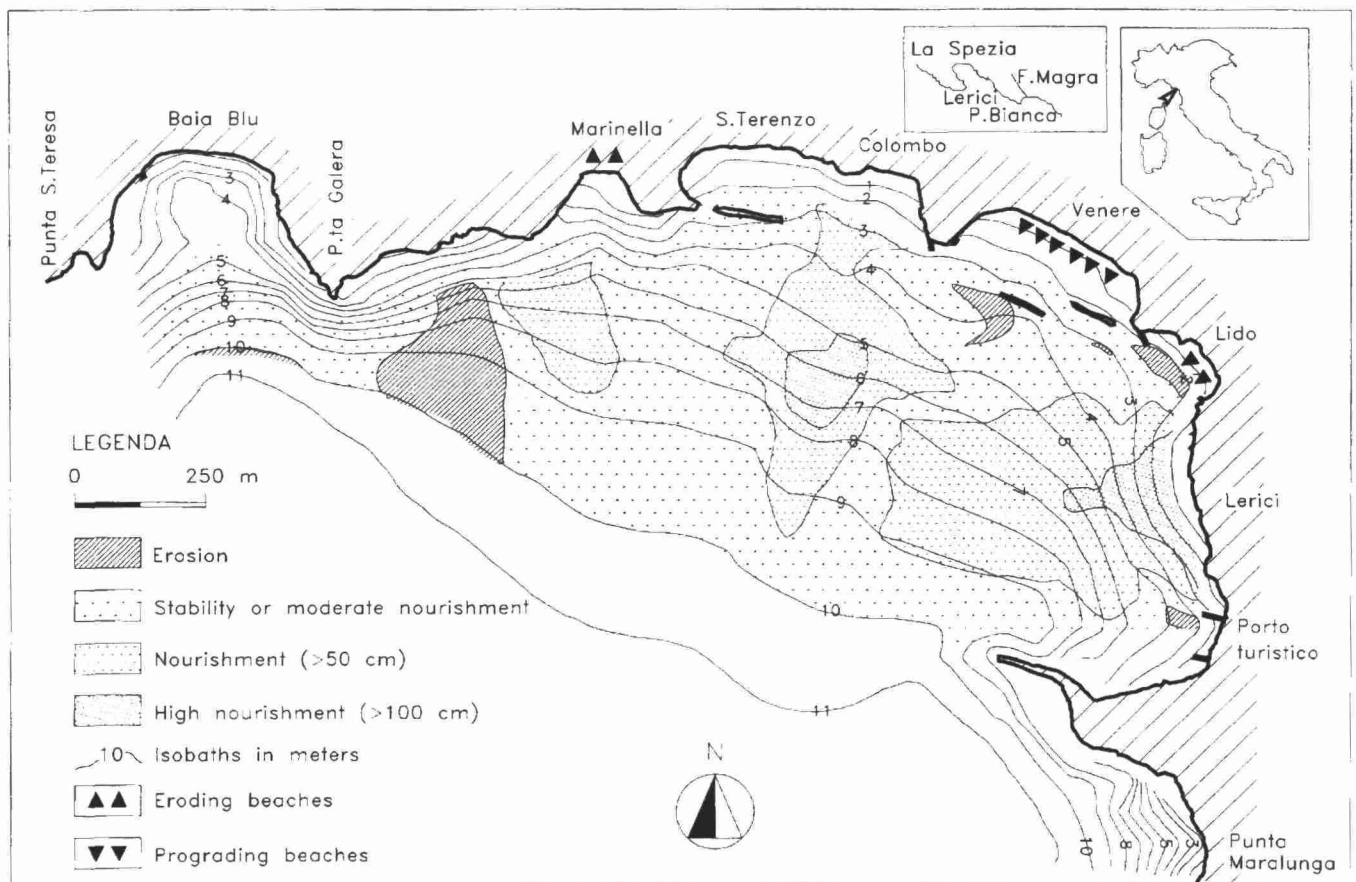


Fig.1 - Map of recent evolutive trends of the Gulf of Lerici (1991/1996).