

GEOMORPHOLOGICAL OUTLINE FEATURES OF THE EASTERN IBERIAN PENINSULA MARGIN (WESTERN MEDITERRANEAN)

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Abstract

This work is a summary of the study carried out for the preparation of the Spanish Continental Margin Geomorphological Map at 1/1.000.000 scale, that nowadays is being elaborated by the Geological Survey of Spain, Marine Geology Division. The main objective of this study is to map the main continental margin and abyssal plain morphological features, and the related active processes, on the basis of several scientific publications and local studies from different authors and new data from recent oceanographic cruises.

Keywords: Western Mediterranean, geomorphological map, Catalonia-Iberian continental margin, Betic continental margin

In the elaboration of this map, three processes that influence the relief generation have been established: tectonic, erosive and depositional processes. In addition, two more groups have also been differentiated: poligenetic (unknown origin) and gravitational processes. The mapping of these elements has been carried out upon a simplified bathymetric base provided by the Marine Hydrographic Institute and upon a synthetic sea bottom lithological cartography.

Two main sectors have been differentiated in the eastern Iberian margin, specifically in the Mediterranean margin context, according to structural and sedimentary features:

1) Catalonia-Iberian continental margin. It extends from the Creus Cape (Girona) in the north, to the southern zone of the Valencia Gulf. This area is structurally controlled by two main directions: the NE-SW direction which controls the margin orientation, whereas the NW-SE direction constitutes the submarine canyons trend. The continental shelf has 55 km of average width. The principal morphologic features of this physiographic unit are the presence of important prodeltaic bodies (where it can be remarkable the Ebro and Llobregat), and a relevant erosive surface that extends southwards the Ebro Delta, affected in its southern margin by the Columbretes Islands volcanic outcrops. The continental slope is crossed by submarine canyons, some of them of huge length (La Fonera, Blanes and Francolí) and important turbiditic deposits (Ebro and Rodano). These canyons and turbiditic deposits converge in a broad NE-SW direction basin, named the Valencia Trough, where a turbiditic deposit named Valencia Fan is developed in its distal part, extending towards the abyssal plain.

2) Betic continental margin. It extends from the La Nao Cape, in the north, to the Gibraltar Strait, in the south, including the Balearic Islands. The morphological features of this area are controlled by a short fluvial system, giving place to scarce sedimentary supplies on the shelf, and by an intensive tectonic activity, which controls the narrow dimensions of the shelf, and the slope compartmentalization caused by structural highs. The southern sector (Gibraltar Strait and Alboran Sea) is tectonically controlled by two main structural directions: NE-SW (e.i. Alboran Ridge) and NW-SE (e.i. Djibouti and Avempace Banks). It is remarkable the development of a significant marginal platform (Motril Platform) on the continental slope. The eastern sector is compartmentalized and controlled by the activity of N-S trending faults (Palomares and Adra faults) and E-W faults (Mazarron escarpment). In this sector it stands out the presence of sand ridges of kilometeric length following a N-S orientation, which developed in front of Menor Sea. The Balearic Promontory constitutes the eastwards prolongation of the NE-SW Betic trend. The continental margin of these islands shows a narrow shelf and a smooth slope to the north and west, that becomes steeper to the south (NE-SW orientation Emile Badout escarpment) and east (N-S orientation Menorca escarpment). Both escarpments have a tectonic origin. In the Emile Badout escarpment numerous volcanic buildings have been observed. The main Betic continental margin morphosedimentary features are the Ceuta and Menorca contouritic drifts as well as the Calahonda, Almería and Menorca turbiditic fans.