

# EVIDENCE OF BOTTOM CURRENT-CONTROLLED QUATERNARY SEDIMENTATION ON THE EASTERN SICILY MARGIN (IONIAN SEA)

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## Abstract

There is still little knowledge concerning the depositional transitional environment located between the continental escarpment and the abyssal plain in the Eastern Sicily margin. Currently, the sedimentary processes that take place in deep sea are not fully understood. Integrated geological and geophysical investigation methods allow us to study these particular deposits, which form under conditions still to be fully understood. In this study we present the identification of large up-slope and up-current sediment waves of contouritic origin never observed before. We infer the current dominated deposits to have started to develop since about 650 ka in response to an increase of bottom current velocity associated to the Mid Pleistocene Transition.

**Keywords:** *Deep sea sediments, Waves, Currents, Continental margin, Ionian Sea*

We here present results from geophysical data acquired in the Ionian Sea aboard the OGS-Explora research vessel, during the third phase of the “Canyon processes in sediment-undersupplied margins: A geomorphometric investigation of the Malta Escarpment submarine canyons (Cumecs3)” campaign. The survey succeeded in gathering new information regarding the sedimentary processes that develop at the base of the Malta Escarpment. The geophysical data collected with the multibeam echosounder and the sub bottom profilers integrated with the multichannel seismic reflection imaging highlighted evidence of peculiar sedimentary deposits forming at a depth of about 2400 mbsf, which we interpreted as current-controlled sediment waves [1]. These sedimentary structures have considerable size with a height of 50 m and a wavelength of 2500 m. They cover a large area at the base of the escarpment (figure1-2).

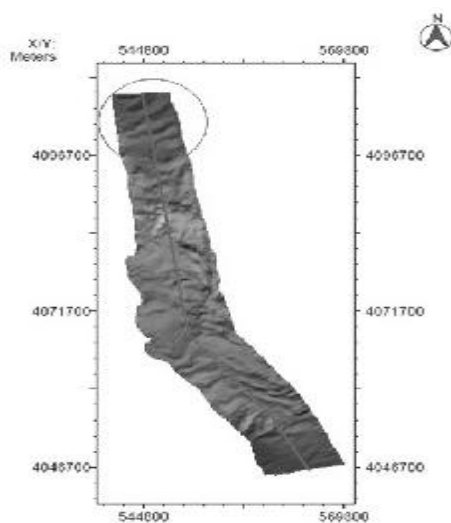


Fig. 1. Multibeam bathymetric data.

The analysis of these geophysical data integrated with oceanographic data allowed the definition of the features of the transport agent of the sediment. It is very likely that these structures were formed by a bottom current that moves from north to south along the base of the escarpment with speeds greater than 10 cm/s, according to data recorded at the mooring station KC2, [2][3]. The stratigraphic correlation between the seismic section CU15\_001 and the DSDP 374 well enabled to estimate the age of the onset of contouritic deposits to be ca.650 ka. The main outcome the preliminary analyses of the available data suggests that the contouritic sedimentary process began during the Mid Pleistocene Transition (MPT), a paleoclimate event that consists of a transition of the glacial cyclicity from 40 to 100 ky.

The comparison of our sedimentary features with similar contouritic sediments

identified in the Tyrrhenian Sea suggests that the MPT was an important paleoclimate event that developed during the Quaternary and perturbed the sedimentary deposition at a regional scale [4]. It is most likely that the MPT led to the increase of the bottom currents' velocities, promoting the formation of contouritic deposits in the Mediterranean Sea.

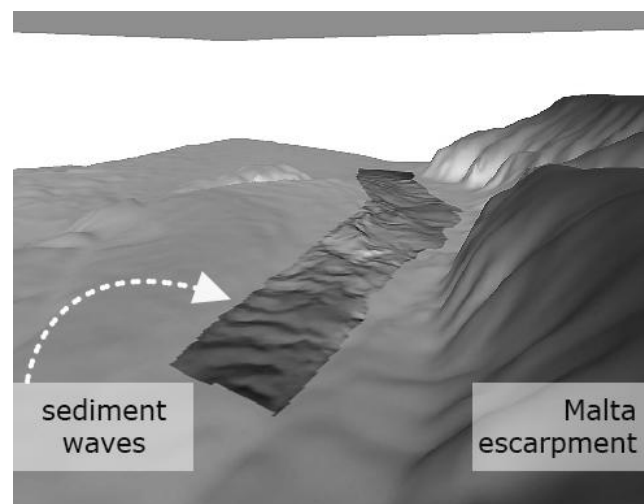


Fig. 2. In the illustration multibeam bathymetric map superimposed to cartography of EMODNET dataset. Processing made with PDS2000 and global Mapper software.

## References

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