

HOLOCENE SEA-LEVEL CHANGE IN THE MEDITERRANEAN SEA: QUANTITATIVE RECONSTRUCTIONS BASED ON FORAMINIFERAL TRANSFER FUNCTIONS

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Abstract

Results from Late Glacial and Holocene relative sea-level estimates in shelf carbonate environments of the Western Mediterranean Sea based on various regression methods and, on Plankton/ Benthos ratios, are presented. The relative sea-level estimations for the different regions are similar to the global sea-level history underlying the potential of benthic foraminifera for quantitative sea-level reconstructions.

Keywords: Western Mediterranean, Sea Level, Foraminifera

Introduction

Quantitative sea-level reconstructions using planktonic and benthic foraminifera were more applied in the recent past and, give a potential for paleo-sea level reconstructions over various timescales or for climate modeling.

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Methods

The sea level estimations were based on various regression methods such as Weighted Averaging (WA), Partial Least Squares (PLS) and, a combination of both. Further, Modern Analogue Technique (MAT) and, a method based on Plankton/ Benthos ratios were used. The transfer functions generated from recent benthic foraminiferal assemblages in surface samples were applied on fossil data-sets from the Alboran Platform, the Oran Bight and the Mallorca shelf (cores 342-1, 367-1 and 401-1).

Results

The best predictive potential is given for the WA-PLS method. The relative sea-levels estimates are similar to the global sea-level history on the Alboran Platform and off the Mallorca Shelf (Fig. 1). In the Oran Bight, our estimates show also a sea-level rise for the past 6000 cal. years BP, but exhibit significant deviation from the global trend likely attributed to age model uncertainties. The sea-level estimates based on transfer functions generated from recent P/B ratios show in generally the global sea-level development, but with a higher inaccuracy. Species-environment relations were investigated, showing that on the Mallorca Shelf substrate and food effects interfere with the sea level signal resulting in a partly overestimation of paleo-water depths.

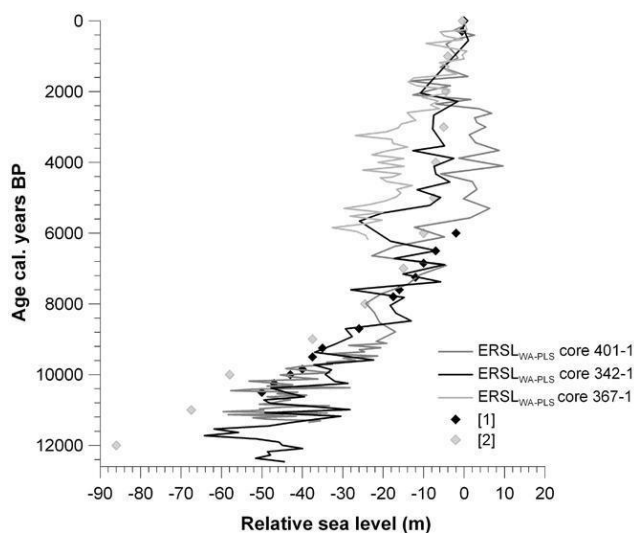


Fig. 1. The relative sea-levels estimates are similar to the global sea-level history on the Alboran Platform and off the Mallorca Shelf

References

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