Geophysical Research Abstracts
Vol. 20, EGU2018-11045, 2018
EGU General Assembly 2018

West to east phasing of the organic-rich deposition in the Mediterranean Sea

Gianluca Marino (1,2), Alessandro Incarbona (3), Laura Rodríguez-Sanz (2), Jennifer D. Stanford (4), Stewart Fallon (2), Eelco J. Rohling (2,5)

(1) Marine Geosciences and Territorial Planning, University of Vigo, 36310 Vigo, Spain., (2) Research School of Earth Sciences, The Australian National University, Canberra, ACT 2601, Australia (gianluca.marino@anu.edu.au), (3) Università di Palermo, Dipartimento di Scienze della Terra e del Mare, 90123 Palermo, Italy., (4) College of Science, Swansea University, Swansea SA2 8PP, United Kingdom., (5) Ocean and Earth Science, University of Southampton, National Oceanography Centre, Southampton SO14 3ZH, United Kingdom

The deposition of organic-rich layers in the Mediterranean Sea testifies to periods of bottom-water oxygen depletion (or even starvation) in a basin that at present is vigorously ventilated. Although these layers have been investigated for more than five decades, several aspects of their formation remain elusive, including the cause(s) of their apparent asynchroneity between the western and eastern Mediterranean sub-basins. This feature – so far firmly documented only through the last glacial-interglacial transition – may reflect: (i) a different (and differently timed) climate forcing of the oceanographic developments in the two sub-basins; and/or (ii) different ways in which deep-water masses are renewed (hence ventilated) across the Mediterranean Sea.

Here we present new, high-resolution and precisely dated bulk sediment and foraminiferal geochemical records along with co-registered time series of coccolith assemblages that span the last and penultimate glacial terminations and ensuing interglacial periods from Ocean Drilling Program (ODP) Site 975, in the western Mediterranean. This dataset allows reconstruction in detail of key environmental parameters, such as terrestrial run-off, freshwater discharge, water column stratification, primary productivity, and bottom-water oxygenation across two different glacial-interglacial transitions in the western Mediterranean. Precise chronological controls allow direct comparison with similar time series from the eastern Mediterranean sub-basin and, in turn, unambiguous identification of the west to east phasing of climate and oceanographic changes and of the attendant organic-rich deposition. We will discuss this evidence in the context of the contemporaneous evolution of the insolation forcing, sea-level, and low to mid-latitude climate, which play a central role in the Mediterranean deep-sea ventilation and exhibit markedly contrasting developments during the last two glacial-interglacial transitions.