Anoxic sedimentation across the Mediterranean Sea

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The organic-rich layers that punctuate the Mediterranean sedimentary record attest to past episodes of bottom-water anoxia that are contrasted with the vigorously ventilated modern basin. Evidence from the last glacial-interglacial transition indicates that deep-sea anoxic conditions developed asynchronously in the western and eastern sectors of the Mediterranean Sea, but corroboration of this phasing through older intervals remains elusive. Addressing this issue is central to the debate on the origin of the Mediterranean organic-rich layers, in that the observed west-to-east asynchroneity may reflect: (*a*) a different (or differently timed) climate forcing; and/or (*b*) different ways in which deep-water masses are ventilated across the basin.

Here we present new, high-resolution and precisely dated bulk sediment and foraminiferal geochemical data, along with co-registered time series of coccolith assemblages, mineral composition, and sediment grain size from western Mediterranean Ocean Drilling Program (ODP) Site 975. The dataset allows reconstructing, e.g., terrestrial run-off, freshwater discharge, water column stratification, primary productivity, and bottom-water oxygenation across the last and penultimate glacial terminations and ensuing interglacial periods. Through comparison with contemporaneous data from the eastern Mediterranean we will discuss the west to east phasing of climate and oceanographic changes, and emphasise their implications for the organic-rich deposition in the basin. Finally, we will examine the occurrence of oxygen depletion of the Mediterranean bottom waters in the context of the contemporaneous evolution of the insolation forcing, sea-level, monsoon intensity, and high-latitude climate.