

# Millennial scale climate variability during Marine Isotope Stage 19: calcareous nannofossil, alkenone, and planktonic foraminiferal evidence at ODP Site 975 (Balearic Basin)

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The study of Marine Isotope Stage (MIS) 19 (ca 0.78Ma), the best analogue of MIS 1, is of particular interest for the scientific community because it offers the opportunity to explore the natural length of the current interglacial and the dynamics of glacial inception in the absence of human action. The analogy between MIS 19 and MIS 1 relies especially on the close astronomical configuration of their orbital parameters (Tzedakis *et al.*, 2012; Yin & Berger, 2015). Furthermore, it has been suggested that the deglaciation history that is associated with the beginning of MIS 19 (Termination IX) was interrupted by short-term climate phases (Giaccio *et al.*, 2015), an analogy with the last deglaciation. Recently, a similar climatic evolution between Termination IX and Termination I has been suggested because of distinct changes in calcareous plankton and pollen assemblages in the marine Montalbano Jonico Section (Maiorano *et al.*, 2016) in southern Italy.

In the present study, calcareous nannofossils, biomarkers (alkenones), and planktonic foraminifera were investigated in the Ocean Drilling Program Site 975, located in the western Mediterranean, in order to understand responses to environmental and climate changes that began at the interglacial inception of MIS 19. Biomarkers, in particular, were used to reconstruct sea surface temperature (SST) and primary paleoproductivity, and to

track episodes of massive cold freshwater input. The high temporal resolution of our data (about 200–400 years) provided additional evidence that Termination IX was characterized by high climatic variability, a fact that has not been previously identified in other middle Pleistocene glacial-interglacial transitions.

## References

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