

Mediterranean marine sediment core database: Unlocking paleoclimate signals for the last 20,000 years

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<https://doi.org/10.58998/jnr3296>

The Mediterranean Sea is a key area for the study of the dynamics of past climates thanks to its unique geography and hydrology. Its relatively small size and rapid response to climate change make it an ideal laboratory for deciphering the impact of marginal basins on global climate (Chiggiato et al., 2023). Within this context, climatic indicators (proxies) serve as indispensable tools for characterizing intervals for which instrument records are not available. Furthermore, they can be used to construct future scenarios.

Here, we present a comprehensive database derived from more than 1500 marine sediment cores collected in the Mediterranean Sea that span the last 20,000 years, or from the Last Glacial Maximum (LGM) to the present day. This database provides general information about oceanographic cruises and detailed descriptions of the recovered sediment cores. For each core, proxies of the primary environmental variables are provided from the literature.

The main aim of this effort was to identify the most studied variables and proxies used for the reconstruction of past climatic conditions over the last 20 kyr, as well as to identify any knowledge gaps in terms of proxies and space and time coverage. We have compiled climatic data from over 400 scientific articles and selected 36 cores from the Mediterranean Sea, including both extensively studied cores and those with potential significance for future research efforts. One notable aspect of this work is to offer a comprehensive graphic basin-scale synthesis of the main environmental variables available in the Mediterranean Sea over the last 20 kyr and to categorize the available proxies into abiotic (76%) and biotic (24%) proxies. Among the biotic proxies, foraminifera are the most studied, followed by calcareous nannofossils. Available paleoclimatic data on calcareous nannofossils have a fairly even distribution across the Mediterranean Sea and are primarily derived from quantitative assemblage studies, reworked coccoliths, and changes in the abundance of specific taxa (e.g., *Emiliania huxleyi* and *Florisphaera profunda*).

References:

Chiggiato, J., Schroeder, K., Mourre, B., Miramontes, E., Lionello, P., Marcos, M., Pinardi, N., Mason, E., Álvarez, M. & Trincardi, F. 2023. Introduction. *Oceanography of the Mediterranean Sea: An Introductory Guide*. Elsevier: 1–11.