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Benthic foraminifera as tools to distinguish contourites and turbidites

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Contourites occur where along-slope bottom currents induce large accumulations of sediments in the deep sea (Faugères and Stow, 2008). Distinguishing among contourites and other depositional facies on continental slopes is fundamental for paleoenvironmental reconstructions like bottom current velocities. Nonetheless, reliable and easily applicable diagnostic criteria to properly differentiate between contourites and other coarse-grained and/or graded deep-water deposits such as turbidites are still sparse (e.g., de Castro et al., 2020). The differentiation and interpretation of these deposits is particularly complex in areas where downslope and along-slope sedimentary processes co-occur.

The SW Iberian Margin represents an ideal natural laboratory to study the complex interaction of downslope and along-slope processes. Persistent bottom current activity of Mediterranean Outflow Water (MOW) since the early Pliocene (García-Gallardo et al., 2017) resulted in the deposition of thick contourite drift bodies in the Gulf of Cádiz (Hernández-Molina et al., 2014). At the same time, downslope transport, channeled through submarine canyons, occurs frequently. Extensive turbidite intervals - intercalated between contouritic layers and often reworked by bottom currents - have been identified in several Pleistocene and Pliocene sediments in this area (Stow et al., 2013).

The aim of this study is to define diagnostic criteria to differentiate normally graded contourites and turbidites as well as reworked turbidites based on microfaunal analyses. Benthic foraminiferal assemblages along Pleistocene contouritic (~0.5 Ma) and turbiditic (~0.9 Ma, ~1.1 Ma) sequences in the Gulf of Cádiz (IODP Site U1389) are evaluated to test if their faunal composition provides a reliable tool to distinguish these deposits and the underlying sedimentary processes.

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