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The Pianosa Contourite Depositional System (Northern Tyrrhenian Sea): drift morphology and Plio-Quaternary stratigraphic evolution

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The Pianosa Contourite Depositional System (CDS) is located in the Corsica Trough (Northern Tyrrhenian Sea), a confined basin dominated by mass transport and contour currents in the eastern flank and by turbidity currents in the western flank. The morphologic and stratigraphic characterisation of the Pianosa CDS is based on multi-beam bathymetry, seismic reflection data (multi-channel high resolution mini GI gun, single-channel sparker and CHIRP), sediment cores and ADCP data. The Pianosa CDS is located at shallow to intermediate water depths (170 to 850 m water depth) and is formed under the influence of the Levantine Intermediate Water (LIW). It is 120 km long, has a maximum width of 10 km and is composed of different types of muddy sediment drifts: plastered drift, separated mounded drift, sigmoid drift and multicrested drift. The reduced tectonic activity in the Corsica Trough since the early Pliocene permits to recover a sedimentary record of the contourite depositional system that is only influenced by climate fluctuations. Contourites started to develop in the Middle-Late Pliocene, but their growth was enhanced since the Middle Pleistocene Transition (0.7-0.9 Ma). Although the general circulation of the LIW, flowing northwards in the Corsica Trough, remained active all along the history of the system, contourite drift formation changed, controlled by sediment influx and bottom current velocity. During periods of sea level fall, fast bottom currents often eroded the drift crest in the middle and upper slope. At that time the proximity of the coast to the shelf edge favoured the formation of bioclastic sand deposits winnowed by bottom currents. Higher sediment accumulation of mud in the drifts occurred during periods of fast bottom currents and high sediment availability (i.e. high activity of turbidity currents), coincident with periods of sea level low-stands. Condensed sections were formed during sea level high-stands, when bottom currents were more sluggish and the turbidite system was disconnected, resulting in a lower sediment influx.