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High resolution mapping of offshore morphosedimentary features in the northwestern Iberian continental margin and abyssal plains

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Morphosedimentary features along the northwestern Iberian continental margin and abyssal plains (Figure 1) are presented from high-resolution multibeam and seismic profiles. Sedimentary processes are decoding and their implications discussed. The study area (approx. 90000 km² and 300-5000 m water depth) is composed by different and large morphosedimentary features, such us structural features (escarpments, marginal platforms and related fluid escape structures); and depositional and erosive origin features developed both by bottom-currents influence (moats, abraded surfaces, sediment waves, contourite drifts and ridges) or by mass-movement processes (gullies, canyons, channel-levee complex, slides, submarine fans).

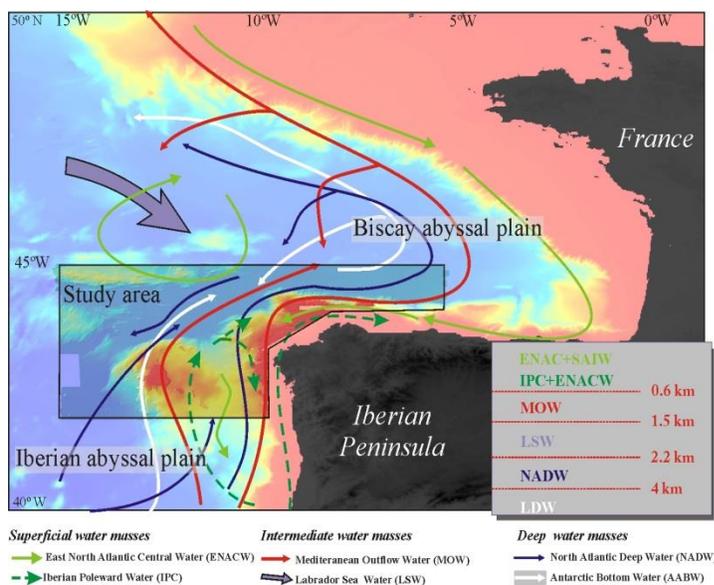


Figure 1: Study area location (square), indicating the regional circulation of the main water masses (Modified from Hernández-Molina et al. [1]).

The continental slope is mostly subject to different types of slope failures, such as slides, mass-transport and turbidity processes. This zone is also subject to the action of different currents (North Atlantic Central Water—ENACW, Mediterranean Outflow Water—MOW, Labrador Sea Water—LSW and North Atlantic Deep Water—NADW) that interact with the marginal platforms (Ortegal, Pardo Bazán and Castro) and the Galician Bank, favoring the contourite formation and the reworking of sediments [2]. The abyssal plains (Biscay and Iberian) are affected by debris flows and turbidity currents where complex channel-lobe systems develop (Cap Ferret and Armorican) [3]. However, in this turbidite-dominated scenario, several contourite features have also been observed at the foot of the continental slope by the influence of the deepest water masses (NADW and Lower Deep Water—LDW).

The recent architectural and sediment dynamic in the studied area is complex and results from the structural framework and the great variability of interconnected sedimentary systems and processes.

Tectonic activity and sea-level changes, together with present processes of sediment supply and climatic conditions have a critical influence on the present configuration of the area; tectonism and sediment source have constituted a controlling factor on a longer-term scale, whereas climate, sea-level and oceanography changes have played a major role on a shorter-term scale.

References:

- [1] Hernández-Molina et al. (2011) *Geo-Marine Letters* 31: 315-341
- [2] Llave et al. (2015) *Boletín Geológico y Minero* 126(1-3): 219-256
- [3] Jané et al. (2011) *Geogaceta* 50(2): 141-144

