

{rokbox title=|Imagen del coral *Madrepora oculata* tomada con ROV en el cañón de Guilvinec (Bahía de Vizcaya) en 2008 a 691 metros de profundidad :: Foto: Autores| thumb=|images/stories/ieo/imagenespublicaciones/centro-oceanografico-baleares-covadonga-orejas-madrepora-oculata-bahía-vizcaya-montero-et-al-2013-thumb.jpg|images/stories/ieo/imagenespublicaciones/centro-oceanografico-baleares-covadonga-orejas-madrepora-oculata-bahía-vizcaya-montero-et-al-2013.jpg|/rokbox}

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[Decadal changes in the mid-depth water mass dynamic of the Northeastern Atlantic margin \(Bay of Biscay\)](#)

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Abstract: The lithium/magnesium (Li/Mg) molar ratios, radiocarbon measurements ($\Delta^{14}\text{C}$) and Nd-isotopic composition (ϵNd) of the aragonite skeleton of a branching cold-water coral (CWC) species *Madrepora oculata* collected alive in the Bay of Biscay at ~691 m water depth were investigated to reconstruct a robust record of the mid-depth water mass dynamics between 1950 and 1990 AD. Temperature estimates based on the skeletons Li/Mg molar ratios reveal small decadal changes of about 1 °C at thermocline depth synchronous to and of similar amplitude as surface temperature anomalies. $\Delta^{14}\text{C}$ measurements shows quasi-decadal oscillations of 15‰ around pre-bomb $\Delta^{14}\text{C}$ average value of $-59 \pm 6\text{‰}$ and post-bomb $\Delta^{14}\text{C}$ of $-12 \pm 6\text{‰}$, which most likely reflect decadal changes of water mass exchange across the thermocline. The coral ϵNd values remain in narrow ranges of -11.9 to -10.2 , similar to the isotopic composition of East North Atlantic Central Water, but show highest values in the late 1950s, and early 1960s, 1970s, and 1980s. The punctuated changes of the coral Nd-isotopic composition may thus reflect periods of particular enhanced advection of temperate intermediate water (mid-depth Subpolar Gyre/Mediterranean Sea Water). Altogether, our robust multi-proxy record provides new evidence that Northern Hemisphere atmospheric variability (such as, North Atlantic Oscillation and East Atlantic pattern) drives changes not only in the thermocline but also in the mid-depth water-mass advection patterns in the Northeastern Atlantic margin. However, the interannual variability of our record remains to be tested.

Keywords: Northeast Atlantic margin, Bay of Biscay, cold-water coral, trace elements, radiocarbon, neodymium isotopes