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Paleo-environment of cold-water coral initiation in the NE Atlantic: Implications from a deep-water carbonate mound drilling core

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The understanding of the paleo-environment during initiation and early development of deep-water carbonate mounds in the NE Atlantic is still under debate. The Integrated Ocean Drilling Program Expedition 307 sailed in 2005 to the Porcupine Seabight in order to investigate for the first time sediments from the base of a giant carbonate mound (Challenger Mound, 155 m). These results indicate that the initiation and start-up phase of this carbonate mound coincides with the beginning of the Northern Hemisphere Glaciation (NHG) at around 2.6 Ma (Kano et al. 2007). Further carbonate mound development seems to be strongly dependent on rapid changes in paleo-oceanographic and climatic conditions around the Pliocene-Pleistocene boundary, especially characterized and caused by intermediate water masses.

To characterise the paleo-environmental and paleo-ecological setting favourable for the initial coral colonization at 2.6 Ma, we use well-developed proxies such as $\delta^{18}\text{O}$ and $\delta^{13}\text{C}$ of planktonic (*Globigerina bulloides*) and of a collection of benthic foraminifera (*Cibicidoides wuellerstorfi*, *Discanomalina coronata*, *Cibicides lobatulus*, *Lobatulus antarctica*, *Planulina ariminensis*), benthic foraminiferal assemblages, as well as grain size analysis. These proxies indicate variability in seawater temperature, salinity and density of intermediate water masses from southern origin (Mediterranean, Bay of Biscay) supporting cold-water coral settlement and initial development in the Porcupine Seabight.

References: Kano et al. (2007) Age constraints on the origin and growth history of a deep-water coral mound in the northeast Atlantic drilled during Integrated Ocean Drilling Program Expedition 307. *Geology*, 35(11):1051–1054.