

PI's:

Jacek Raddatz,
Martin Frank, Wolf-Christian Dullo

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ECHO - Intermediate water mass history at a cold-water coral habitat in the North Atlantic: Geochemical signals from IODP Site 1317

The Integrated Ocean Drilling Program (IODP) Expedition 307 sailed in 2005 in order to drill for the first time the entire sediment body of a huge cold-water coral carbonate mound in the Porcupine Seabight, NE Atlantic (Fig. 1). In general, cold-water corals and hence carbonate mound initiation and development in the Porcupine Seabight seems to be strongly dependent on changes in the interaction between intermediate water masses such as the Mediterranean Outflow Water (MOW) and the Eastern North Atlantic Water (ENAW).

The main aim of this research project is the reconstruction of the inflowing intermediate water masses (MOW, ENAW). We propose to use cold-water coral *Lophelia pertusa* (Fig. 2) from IODP Site 1317 as an archive for the neodymium Nd-isotope composition of past water masses in the Porcupine Seabight. These investigations will improve our understanding of the role and trigger mechanisms of intermediate water mass dynamics, circulation, and potential admixture (MOW, Bay of Biscay) in relationship to the colonization of cold-water corals in the Porcupine Seabight around 3 Ma, as well as during the Pleistocene and Holocene during the later development of carbonate mounds.

Three major questions form the backbone of this proposal:

Was mound initiation and further development controlled by the reintroduction of MOW? Are the different stages of mound growth affected by variability of intermediate water masses and or/vertical movements of MOW? How does MOW interact with the ENAW? Were both water masses ambient at the site of coral growth throughout the time of mound growth or were there shifts in their relative proportions?



Figure 2. The scleractinian cold-water coral *Lophelia pertusa* from Lophavet (off Norway), POS 391

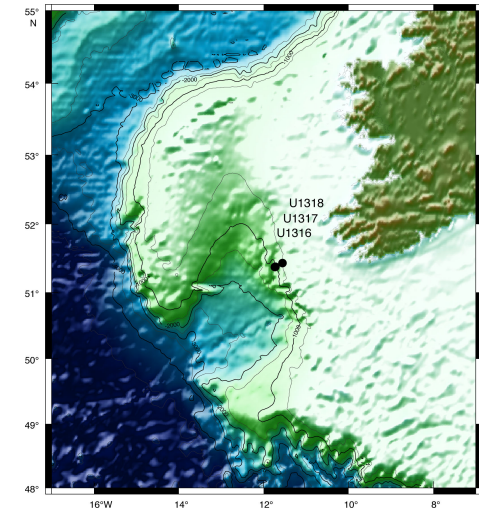


Figure 1. Location of Porcupine Seabight and Expedition 307 operations area (from Expedition Scientists, 2005).