Geophysical Research Abstracts,
Vol. 10, EGU2008-A-09477, 2008
SRef-ID: 1607-7962/gra/EGU2008-A-09477
EGU General Assembly 2008

Drilling a NE Atlantic continental margin cold-water coral carbonate mound : evaluating the hydrodynamic and environmental conditions during Challenger Mound development (IODP Exp.307).

M. Thierens (1), J.-B. Stuut (2), J.Titschack (3), R.O'Donnell (1), B.Dorschel (1) and A.J. Wheeler (1)

(1) Dept. of Geology & Environmental Research Institute, University College Cork, Ireland,
(2) Center for Marine Environmental Sciences (MARUM), University of Bremen, Germany,
(3) Institute of Palaeontology, University of Erlangen-Nuremberg, Germany
(mieke.thierens@gmail.com / Fax: +353 214901932 / Phone: +353 214901947)

During IODP Expedition 307, a precursor project to the ESF-funded CARBONATE programme, Challenger Mound, one of the large cold-water coral carbonate mounds along the eastern Porcupine Seabight continental margin (NE Atlantic, SW off Ireland), was successfully drilled. This complete recovery of a continuous sedimentary sequence through a carbonate mound provides us for the very first time with material documenting the entire mound development process and is therefore crucial in our quest to unravel the mechanisms driving and maintaining the build-up of one of these intriguing features.

Changes in the hydrodynamic and sedimentary regime are assumed to be amongst the main controls on cold-water carbonate mound evolution. Therefore, high-resolution particle size analysis of the lithic sediment component is used in this study as primary proxy for reconstructing the hydrodynamic conditions during Challenger Mound development.

So far, results from these analyses and subsequent statistical processing [Weltje, G.J. (1997). End-member Modelling of Compositional Data: Numerical-Statistical Algo-

rithms for Solving the Explicit Mixing Problem. *Mathematical Geology* 29 (4), 503-549.] indicate repeated shifts in compositional variability and hydrodynamic conditions during sediment deposition on Challenger Mound, from lower-energetic conditions to higher-energetic environments and vice versa. This implicates environmental variation over interglacial-glacial timescales, ongoing throughout the whole mound development period. In conjunction with additional data, this dataset furthermore provides insight in local current regimes and sediment dynamics, the specific role of cold-water corals in these complex geo-biological systems and the differentiation of different sediment contributors to the Challenger Mound system.

Overall, this project shows the feasibility and necessity of carbonate mound drillings in contributing to our fundamental understanding of the development of these mid-latitude continental margin carbonate systems.