



## **Reconstruction of Carbonate Mound Development in the Porcupine Seabight on Isotope Geochemistry of Cold-Water Coral *Lophelia pertusa***

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Carbonate mounds within the Porcupine Seabight have been subject of detailed investigation by several campaigns (ECOMOUND, GEOMOUND, ACES of the EU 5th Framework Programme, ESF EUROMARGINS Project MOUNDFORCE, IODP Drilling Leg 307).

The Propeller Mound in the Hovland Mound Province has been intensively sampled during the past five years resulting into an understanding of external control mechanisms on mound growth related to paleoceanographic and climatic variations (Rüggeberg et al. 2005, Dorschel et al. 2005). Therefore, Propeller Mound provides an outstanding research site for reconstructing the growth development of a carbonate mound structure.

Propeller Mound is elevated up to 150 m above the surrounding sea floor, possesses a N-S elongation of about 3 km and a maximum extension of 1.5 km in EW direction. The mound base is characterised by an erosional unconformity, which has been interpreted as seismic unconformity C10 indicating an age of Early Pliocene (De Mol et al. 2002). The maximum height of Propeller Mound from the mound base to the top corresponds to ~270 m.

This study we focussed on three sediment cores recovered at different sites on Propeller Mound. U/Th age data on coral fragments of *Lophelia pertusa* sampled at distinct depths within gravity cores are used to reconstruct mean growth rates for each site (GeoB 6728-1: 2.5 cm/kyr; 6729-1: 0.4 cm/kyr; 6730-1: 1.1 cm/kyr). The differences of mound growth between the sites indicate variations in external control mechanisms

(currents, nutrients, sediment drift) resulting into different colonising stages of the coral ecosystem.

Core GeoB 6730-1 indicates a stepwise mound growth fitting the stable oxygen and carbon isotope record. Maximum growth rate of 5 cm/kyr are determined for interglacial periods. Extrapolation of this growth rate to the complete mound height implies a minimum age of initial mound growth of 4.6 Myr B.P. A maximum age is given by the seismic unconformity C10 with approx. 5 Myr B.P.

#### References:

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Dorschel B., Hebbeln D., Rüggeberg A., Dullo W.-C., and Freiwald A. (2005) Growth and erosion of a cold-water coral covered carbonate mound in the Northeast Atlantic during the Late Pleistocene and Holocene. *Earth and Planetary Science Letters* 233, 33-44.

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