

Theme 2 (or 4)

Back to the Darwin Mounds

V.A.I. Huvenne¹, D.G. Masson¹, B.J. Bett¹, T.P. Le Bas¹, F. McBreen², S. McPhail¹, R. Ross³

1 National Oceanography Centre, Southampton, European Way, Southampton, SO14 3ZH, UK, vaih@noc.ac.uk

2 Joint Nature Conservation Committee, Monkstone House, City Road, Peterborough, PE1 1JY, UK, Fionnuala.McBreen@jncc.gov.uk

3 Plymouth University, 203 Davy, Drake Circus, Plymouth, PL4 8AA, UK, Rebecca.Ross@plymouth.ac.uk

The Darwin Mounds are small (5 m high, 75 m across) cold-water coral mounds discovered in 1998 on regional-scale TOBI sidescan sonar data from the N Rockall Trough. The initial discovery was followed by high-resolution sidescan sonar, video and sampling surveys in 1999-2000, revealing more information about the coral species (*Madrepora oculata* and *Lophelia pertusa*) and associated fauna, about mound shape and size and about the sedimentary framework of the area. The mounds are seated within a thin, well-sorted sandy contourite, possibly of post-glacial age, and are at least partly made up of the contourite sands baffled between the coral framework (Huvenne et al., 2009). The build-ups have been partly shaped by the prevailing bottom currents (Wheeler et al., 2008), although Masson et al. (2003) suggested the initial coral settling grounds may have consisted of sand volcanoes formed by localised fluid expulsion (pore waters). The 2000 data, however, also illustrated that many mounds were affected by deep-sea bottom trawling, an observation that eventually led to their protection in August 2003.

Since 1999-2000, however, no further scientific work has been carried out in the area, and a revisit, also to monitor the current status of the mounds, was more than due. Hence, in May-June 2011, we carried out a detailed habitat mapping survey in the area, using the Autosub6000 AUV equipped with high-resolution multibeam, dual frequency sidescan sonar, chirp profiler and monochrome camera. In addition video data and stills were collected with an inspection-class ROV, while the dataset was extended with well-positioned piston cores. This contribution will present some of the first results of this expedition, illustrating the effect of 8 years of cold-water coral protection. In addition, the newly recovered piston cores and very detailed sidescan sonar data will cast new light on the mound formation history.

Huvenne, V.A.I., Masson, D.G. & Wheeler, A.J. (2009). Sediment dynamics of a sandy contourite: the sedimentary context of the Darwin cold-water coral mounds, Northern Rockall Trough. *International Journal of Earth Sciences*. 98(4), 865-884. doi: 10.1007/s00531-008-0312-5

Masson, D.G., Bett, B.J., Billett, D.S.M., Jacobs, C.L., Wheeler, A.J. & Wynn, R.B. (2003). A fluid escape origin for deep-water coral-topped mounds in the northern Rockall Trough. *Marine Geology* 194, 159-180.

Wheeler, A.J., Kozachenko, M., Masson, D.G. & Huvenne, V.A.I. (2008). The influence of benthic sediment transport on cold-water coral bank morphology and growth: the example of the Darwin Mounds, NE Atlantic. *Sedimentology*, 55, 1875-1887. doi: 10.1111/j.1365-3091.2008.00970.x