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Sedimentary processes on the north-west Porcupine Bank: cold-water coral carbonate mounds, erosional scarps and canyons

B. Dorschel (1), A. Wheeler (1), H. De Haas (2), V. Huvenne (3), X. Monteys (4)

(1) Dept. of Geology & Environmental Research Institute, University College Cork, Ireland, (2) Royal Netherlands Institute for Sea Research, Texel, The Netherlands, (3) National Oceanography Centre Southampton, UK, (4) Geological Survey of Ireland, Dublin, Ireland (b.dorschel@ucc.ie / Fax: +353 (0)21 4901932 / Phone: +353 (0)21 4901948)

The Porcupine Bank is located ca. 200 miles west of Ireland separating the Porcupine Seabight from the Rockall Trough. Mounds associated with the cold-water corals *Lophelia pertusa* and *Madrepora oculata* have formed in many places on the NW slope of the Porcupine Bank and often occur associated with erosional features such as scarps, canyons and ridges.

The Porcupine Bank is connected to the Irish shelf only by the narrow Slyne Ridge in the north and is therefore relatively starved of terrigenous sediment in comparison with the rest of the Irish margin. Isolation during glacial sea-level low-stands resulted in no direct glacial and fluvio-glacial sedimentation from the British Irish Ice Sheet (BIIS). Holocene successions are mainly reworked, foraminifera-rich, hemipelagic sediments existing under a predominately erosive regime with high current velocities. Sedimentary features such as ripples, scour marks around drop stones and scars are indicative of this erosive bottom current regime in the mound relevant depth range between 700m and 1050m water depth. The lower boundary cited here coincides with the heads of three submarine canyons in the area. The canyons measure ca. 7km across and are ca. 600m deep exiting into the Rockall Trough at ca.2500m.

Cold-water corals, with the potential for mound formation, are common in the study-area and dwell on many outcrops of consolidated sediment and dropstones. At a few sites, the cold-water corals also form giant carbonate mounds with evidence of limited contemporary re-colonisation of mound relicts.

Here we present results from remotely operated vehicles (ROV), multibeam and side-scan sonar surveys. Based on recorded video images, the distribution of corals (alive and dead), outcrops, ripples, dropstones and human impact was mapped with multibeam data providing the necessary spatial information. Further sedimentary information was interpretable from side-scan sonar data. In combination, the data show coral and sedimentary facies distribution and shed light on the processes involved in the formation of carbonate mounds, erosional scarps and canyons and their possible relationships.