

'Hovland' mounds in Porcupine Seabight, NE Atlantic: biological zonation and environmental control

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The 'Hovland' mounds occur in the northern part of the Porcupine Seabight between 52°30'-52°N and 12-13°W, in water depths between 725-900m. 'Hovland' mounds occur as single conical mounds or elongate composite mounds. Linear segments of composite mounds are mostly oriented NE-SW, apparently independent of bathymetry or structural lineaments. In general the mounds have an average slope of 10°, the steepest flanks are located just below the crest with slopes up to 25°. The 'Hovland' mounds root on a surface, the youngest of a complex cut- and fill system. Erosional moats and depositional tails flanking the seabed mounds create local variations in thickness of the embedding sediments. The association of the mounds with current-related features such as moats, sediment tails and biological zonation indicates their location in regions of strong currents. Zonation and biodiversity of the present *Lophelia* reef complexes was investigated by means of videotransects and boxcoreing across some of the mounds. Mainly the northern flanks of the mounds showed patchy *Lophelia* communities in association with a diverse epifauna of mainly sponges and polychaetes. Along these flanks the biological communities showed a symmetrical zonation pattern. Often, a small patch of living *Lophelia* in the centre of the mound slope gradually shifted both sides along the slope in to a dead coral zone that finally extends into a corals rubble zone. In general *Lophelia* showed a patchy distribution interrupted by small areas of sediment.

On-mound sediments are intensely bioturbated and are dominated by terrigenous components. They also contain a large amount of bio-detritic material; azooxanthellate corals (*Madrepora*, *Lophelia*) and shells. The carbonate in the terrigenous mud is covered by coccolithophores, foraminifers, spicules of octocorals, gastropods, crustaceans and coral rubble. Age estimations based on calcareous nannofossil biostratigraphy of a shallow core provide an approximate age of 72ky at 3.3m sediment depth. If the inferred sedimentation rate is extrapolated to the base of this particular mound, mound initiation would have occurred during the Late Pliocene, about 2.2 Ma BP. Mound growth started more or less simultaneously after a period of erosion and non-deposition. This start-up event suggests drastic environmental changes that favoured coral growth at a certain period. Such changes may have been triggered by changes in the oceanographic circulation patterns with the inflow of Mediterranean Outflow Water in the Porcupine Basin.