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Cold-water coral carbonate mounds on the Irish margin: spatial analysis, drill targets and the CARBONATE project

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Cold-water coral carbonate mounds on the continental slope of the northeast Atlantic are certainly among the most amazing geological discoveries of the last decade. They developed as a result of hydrological, biological and geological processes with thickets of cold-water corals mainly *Lophelia pertusa* and *Madrepora oculata* reported from numerous mound sites.

Over the last years, research focused on selected mounds e.g. IODP Sites 1317 visited during IODP Expedition 307 has revealed that many of the investigated mounds are true coral built-ups. The recovered mound sediments were composed of loose coral frameworks embedded in a matrix of fine-grained hemipelagic sediments. The additional calcium carbonate added by the corals was in the form of fragments and bioeroded fine grained carbonate flakes. This increase in calcium carbonate classifies the mounds as spots of enhanced carbonate accumulation in intermediate water depth. So far, the carbonate stored in submarine carbonate mounds in the northeast Atlantic has not been included in any carbon budget estimations. This was mainly due to the lack of information on the abundance and distribution of those mounds.

The recently available high resolution multi-beam bathymetry data recorded during the Irish National Seabed Survey (INSS) allows, for the first time, a mapping of these mounds and mound-like structures enabling an estimation of their abundance and quantification of their contribution to continental slope sediments.

Here, we present the first comprehensive overview and quantification of mounds and mound-like structures based on 25m rastered bathymetric data for the Irish sector of the NE Atlantic. Based on the data, we identified over 1600 mound-like structures along the NE Atlantic slope between 46^{o} 45'N and 57^{o} 30'N. The structures elevate up to 300m above the surrounding seafloor and were usually grouped into distinct provinces often associated with erosive structures such as canyons and moats. 90% of the identified features occurred in water depth between 500 and 1500m.

Assessment of this data will be used to target mounds for drilling during the ESF CARBONATE project.