

## High-resolution vertical habitat mapping of a deep-sea cliff offshore western Greenland

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Vertical environments being understudied despite their great ecological potential, this master's thesis studies a deep-sea wall habitat (~750m depth). The main goal is to understand the complexity of the habitat, by reconstructing the terrain at fine scale. However, the reconstruction of high-resolution deep-sea vertical biotope remains constrained by many methodological and technological aspects. This study contributes to the development of a methodology for extracting terrain information (i.e. bathymetry, backscatter) collected by a multibeam echosounder front-mounted on a ROV. Terrain data were used to achieve a clustering analysis to categorise the wall into potential habitats. These categories were validated with ground-truthing information using a habitat classification scheme. Images allowed to characterise the community to be based on suspension feeders, to observe fishes of commercial interest and to notice the presence of vulnerable species of sponges and cold-water corals. A population of *Lophelia pertusa* was discovered, being the most northerly occurrence of this hard coral in West Greenland waters. Furthermore, annotations of habitat-forming species analysed between terrain clusters showed two main species (Hexactinellida sponges and Nephtheidae soft corals) to colonise uniformly the wall and the giant clam *Acesta* to aggregate more densely at a steep environment highlighted by the habitat mapping analysis.