

Mapping gradients in seafloor characteristics in the Belgian part of the North Sea: preliminary findings and way forward

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Over the last 20 years, multibeam echosounder (MBES) bathymetry and backscatter data and sediment samples have been acquired at regular intervals to monitor the impact of marine aggregate extraction in the Belgian part of the North Sea (BPNS). Although very valuable to monitor changes in seabed characteristics, no systematic and repetitive classifications of the seafloor were produced with these data until now.

Anticipating on a next era in multibeam monitoring with the new RV Belgica, a specific approach will be developed to (1) classify gradients in seafloor characteristics based on MBES data acquired at different frequencies and (2) identify gradual changes in seafloor characteristics over time. To achieve this, a detailed characterization of the acoustic, sedimentological, geotechnical and macrobenthic properties of archetypal morpho-sedimentological environments of the BPNS is required.

A preliminary version of the classification approach is already developed and tested on former MBES data acquired at 300 kHz. The approach relies on the hyper-angular cube concept [Alevizos and Greinert, *Geosciences*, 8, 446 (2018)] and fuzzy classification approaches.

This contribution will illustrate why the concepts of gradients and gradual changes are critical when classifying environments such as the BPNS and how this can be accounted for when classifying MBES data. Subsequently the classification approach and some first classification results will be presented and the following steps of the project will be discussed.

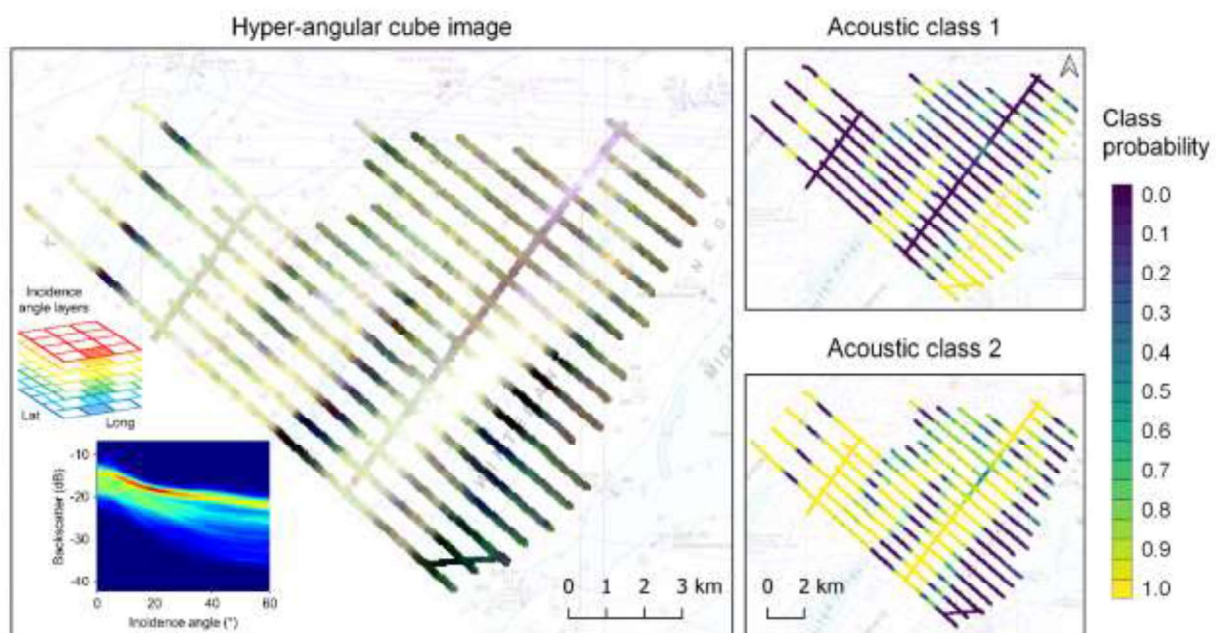


Figure 1. Illustration of the hyper-angular cube image used in the classification, hyper-angular cube concept and angular responses present in the image (left) and the main classification output (right).