EVALUATION OF SONAR TECHNIQUES FOR THE DETECTION OF MACROBENTHIC COMMUNITIES

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The Belgian western Coastal Banks are among the most diverse along the Belgian coastline, not only because of their complex geomorphological structure, but also due to a high biological diversity. A restricted area has been proposed to become a Marine Protected Area and for the definition and follow-up of its ecological value, an intensive and integrated biology-geology project was set up (HABITAT Project, Degraer *et al.*, 2002). On a biological level, three macrobenthic communities and one species association were defined and from a geological point of view most attention was paid to the optimal use of remote sensing techniques. From this, time- and cost-efficient monitoring tools were put forward and are being evaluated within the present study.

The simultaneous application of side-scan sonar and very-high resolution multibeam is regarded an important tool. Although they are established imaging techniques, their capability towards seafloor classification and especially to detect macrobenthic communities needs further investigation; hence ground-truthing remains essential. Based on the already known links between the sedimentology and the macrobenthos on the one side and between the sedimentology and the side-scan sonar recordings on the other hand, a macrobenthic interpretation of side-scan sonar images could be worked out; from this a sonar classification table with a prediction towards a community preference was established. Still, this approach remains qualitative and experience is needed for its interpretation. The acoustic backscatter of very-high resolution multibeam images can also be studied and since it is expressed in numerical values (decibel), it can be statistically treated and further processed to develop a quantitative automated seafloor classification.

One of the aims of the present study is to evaluate the side-scan sonar based classification table in a very restricted area (Trapegeer sandbank – Westdiep swale) in the western Coastal Banks. Moreover, very-high resolution multibeam data was also available and was processed and classified using an automated seafloor classification programme. The predictions towards the occurrence of macrobenthic communities were ground-truthed using Van Veen grab samples that were analysed for their macrobenthic content and their sedimentology.

Keywords: Belgian western Coastal Banks; Side-scan sonar; Very-high resolution multibeam; Seafloor classification; Macrobenthic communities.