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High frequency response on seafloor signature: structure for an innovative methodology for modern monitoring.

Demanding a sustainable sea is currently a necessity more than a duty. To satisfy human needs, shallow seas are affected by a constant increment of activities. Next to fishing and transportation, more traditional, installations for energy sources such as windmills are currently the reality and marine constructions for residential or touristic purposes can be the future.

This constant and incrementing human impact requires an efficient monitoring on the ecosystem variability and moreover requires a thorough knowledge of the seafloor. High resolution (HR) sonar systems are frequently used to monitor our seas. They are often used for seabed mapping and, at a smaller scale, for object detection and time series analysis. The advances in the performances of these systems result in images with a detail of few centimeters resolution. Due to the spatial variability and the complexity present on the seafloor, this degree of detail can be misleading if not associated to an adequate understanding of the seafloor dynamics. During our current investigation we try to associate new image processing techniques to seafloor characteristics. This advanced approach and technique is the basic structure for our future project aiming to produce an innovative methodology for modern monitoring.

A test area on the Belgian Continental Shelf, between the Thorton bank and the Goote Bank is selected based on the long term stability of its physical characteristics. Information regarding the sediment granulometry, shell distribution, and biological presence are collected and associated to backscattering strength values recorded by two different AUV-mounted HR sonar systems (Side Scan Sonar REMUS@900/1800kHz, Synthetic Aperture Sonar MUSCLE@300kHz). Results will be presented during the conference.

Keywords: sonar, monitoring, innovative, approach