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Short-term quantitative analysis of submarine bedform movement in the Sylt-Outer Reef, German Bight, North Sea

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A new approach on optimizing and rectifying backscatter images from side-scan sonar were applied in the seafloor images of a marine protected area in the German part of the North Sea, to monitor bedform change. Hydro-acoustic data from 2017 to 2018 of side-scan and multibeam echosounders were evaluated using the Digital Shoreline Analysis System (DSAS) to quantify the movement pattern of submarine bedforms. Results were verified with grain-size analyses and underwater video footages. The new method provides the rate of change of bedform movement, net bedform movement, and linear regression rate, which can assist in the environmental monitoring of the marine protected area.