

# HEAVY MINERAL CONCENTRATION AS A PROXY FOR HIGH-ENERGY EVENT TRACING ON SANDY BEACHES

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Sandy beaches fronting the Lithuanian coast of the Baltic Sea are composed mainly of quartz sands with a locally important increase in accessory minerals – heavy mineral concentrations (HMCs). The distribution of HMCs are determined by the swash flow, which upper limit varies accordingly to the extent of a high-energy event, and it helps to reconstruct paleo-hydrometeorological conditions. The heavy mineral deposits are distributed from the foreshore or berm crest on relatively calm conditions up to the middle part of the beach or foot of the foredune after severe storms. Our study has shown that higher HMCs are a proxy of hydrodynamic energy extent since the largest deposits are found at the upper boundary of storm surge [1, 2]. The aim of this study was to demonstrate that high-energy events may be traced by measuring HMCs on the sandy beaches.

To identify the high-energy event, a low-field magnetic susceptibility (MS) was measured on 11 cross-shore profiles at every 1 m with 0.565 kHz Bartington MS3 field scanning system with MS2K sensor. The beach topographic data was collected using a Topcon's HiPer SR receiver at 1 m interval. Measuring tape was used to measure the distance between topographic points along the cross-shore profile. The measurements were made three days after each of two subsequent storms. Profiles were analysed using the gathered topographic and MS data with Sequential Regime Shift Detection Software using the regime shift index where the cut-off length is 3 and the significance level  $p = 0.1$ . Analysis revealed that anomaly lag deposit of heavy minerals was found at the upper boundary of storm surge. It has proved that the measurement of HMCs show the extent of hydrodynamic energy.

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