



Measuring Coastal Erosion on Moraine Cliffs of the Baltic Sea using Ground-Based LIDAR - Creating a disposition model of soft rock cliff erosion

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A part of the German Baltic sea coastline is formed as soft rock cliffs, built by the loose material of moraines of the last ice age. Like on hard rock cliffs the erosion is influenced by several parameters. To quantify erosion and calculate the retreat rate of such cliffs there are a variety of methods: Some of them (e.g. erosion pins) are easy to use but improper because of affecting the observed area or having a low resolution. Other methods like aerial photographs and airborne LIDAR (Light Detection and Ranging) are less fault-prone as they do not influence and modify the observed cliffs, but they have disadvantages regarding accuracy (aerial photographs) or the costs of realization (airborne LIDAR).

To solve the described problems in this study a ground based LIDAR-System (LMS-Z420i from RIEGL) was used to measure coastal erosion on moraine cliffs of the German Baltic Sea. By processing (3D-software: RiScan Pro) and analyzing (GIS-software: LIS Desktop/SAGA-GIS) the collected ground-based LIDAR data this study wants to quantify erosion on moraine cliffs and to define the influencing parameters like tide, depth of water, amplitude of the waves, their form and length and the main exposition of the cliffs (climate parameters are provided by the German meteorological service). On the base of these results a disposition model of erosion on moraine cliffs should be developed.

To consider the different conditions on moraine cliffs (e.g. grain size distribution, exposition to the waves, Fetch), coastal erosion is measured at different locations on the German coast of the Baltic Sea. The cliff sections have a length of around 500 m and a height between 5 and 20 m. To extract the temporal variability of cliff erosion the measurements had been done at least four times a year (In case of special or unexpected weather events additional measurements were planned).

The submitted poster will show first results of the measurement of coastal erosion on moraine cliffs of the Baltic Sea, started in the beginning of 2010. Additionally the poster will show the concept how erosion on moraine cliffs can be regionalized e.g. by a disposition model.