



Investigation of the recirculation on the beach of Spiekeroog from in- to exfiltration

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Submarine groundwater discharge (SGD) was determined as an important source for nutrients and trace metals from land into the sea. To estimate the amount and relevance of these compounds, it is necessary to get further information about the modification of the groundwater in the subterranean estuary before discharging to the open water column. It is also important to get longtime data about the dynamics of SGD volumes influenced by tides, storm floods and variation in the groundwater flow. In this study, lysimeters and seepage meters were used to measure the volumes of in- and exfiltrating water on the northern beach of Spiekeroog. It was possible to estimate in- and exfiltration rates at different locations between the high and low water line depending on the beach morphology. The results showed net infiltration above mean sea level and net exfiltration below mean sea level. The exchange rates fluctuated around 1 to 4 liter per hour per square meter.