

Biogeochemical processes at the sedimentwater interface of intertidal sediments sub-project 7 MPI-Bremen



In this project, the cycles of manganese, iron, and sulfur in the different sediment types will be investigated in a quantitative manner in order to understand the fluxes of matter and the biogeochemistry of the intertidal sediments. Through the interaction of geochemical and microbial processes, the decomposition of organic matter is tightly linked to the cycles of O, N, S, Mn, Fe and other elements. Manganese and iron are important for the electron transfer and are recirculated through various redox processes. However, our understanding of the role of these elements in the decomposition pathways is still poor. This project will address:

- (1) the biogeochemical processes that are important at the sediment-water interface and in the uppermost sediment layer
- (2) the mineralization rates of organic matter
- (3) the influence of environmental factors on the mineralization and biogeochemical zonation,
- (4) the relationship between the distribution of microorganisms and the biogeochemical processes and
- (5) the role of the hydrodynamic processes.

All processes will be investigated with respect to their variability on tidal, day-night and seasonal scales in situ as well as in laboratory experiments.



Low tid level



Setting up a lander equipped with microsensors

Transport processes in intertidal sand flats

Lateral sediment transpor

olation and filtration

ble pore water flow and

cotransport of solutes and particulates during ebb fide during flood tide



Sulfide leaks out at low tide and is oxidized to sulfur





Lander arrangement to measure flow above the sediment with ADV and equipment after accident with vessel