



Monitoring the rewetting of a coastal fen –The Hütelmoor site-

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The rewetting of drained peatlands is widely regarded as an adequate measure for the mitigation of greenhouse emissions. Therefore, especially in NE Germany, many peatlands are being rewetted. Baltic coastal peatlands are exposed to high agricultural nutrient input as well as brackish seawater, both of which may control greenhouse gas turnover. Furthermore, our knowledge about greenhouse gas exchange associated with rewetting is mainly based on short-term experiments or space-for-time substitutions. These approaches do not consider the transient character of ecosystem acclimatization to the rapid rise in water level.

In the Hütelmoor close to Rostock, NE Germany, we have established a long term research observatory focusing on the greenhouse gas turnover before and after rewetting. The site is part of the TERENO Northeast network. We determine carbon dioxide and methane fluxes since 2009 with closed chamber and eddy covariance techniques as well as ancillary data on vegetation, hydrology, biogeochemistry, and microbiology.

Gross photosynthesis as well as ecosystem respiration react very sensitively to rewetting, but net carbon dioxide exchange hardly changes. Furthermore, rewetting increases methane release rates on an extremely high level. Despite their transient character, the high methane release rates suggest that, when focusing on greenhouse gas mitigation, careful rewetting is a better management option than flooding. In summary, the system has been destabilized in the first few years following rewetting and only slowly approaches conditions that can be described by common models.