

Water budget and the role of land-sea interactions of a coastal wetland at the German Baltic Coast

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Coastal low moors are characteristic elements of the landscapes along Germany's Baltic Sea coastline. Under natural conditions, their hydrological peculiarities include exchange processes between the fens and the Baltic Sea. Due to human interventions such as the construction of dunes and dykes, drainage systems and lately also renaturation measures, their hydrological regime has been changed various times during the past centuries. The nature reserve "Hütelmoor und Heiligensee" northeast of the city Rostock has been selected as a natural observatory, instrumented with a number of measurement devices, and is therefore well-suited for investigating the effects of past and future changes.

This contribution presents the observational programme and aims at identifying the relevant hydrological processes that affect the water balance of such wetlands. The investigations are based on a monitoring network measuring groundwater levels and electric conductivity within the moor's body since 2009, as well as on measurements of the surface water fluxes across the catchment boundaries and of meteorological parameters. The measurements enable the identification of the governing hydrological processes and patterns. On the basis of a system water budgeting approach we derived balancing of the different water flows across the system's borders (precipitation, evapotranspiration, inflows from the neighbouring parts of the catchment area, subterranean exchange processes with the Baltic Sea and the area's superficial discharge). Furthermore, the episodic input of salty water in case of heavy storm tides may provide a natural tracer. This tracer allows to better identify both vertical processes in the lowland (precipitation, evaporation and rising groundwater levels) as well as lateral transport processes (such as, e.g., water fluxes between groundwater bodies and the area's trench system or land-sea interactions).