The interface of land and sea is of particular interest regarding the exchange of elements, like nutrients, carbon, and sulfur. Submarine groundwater discharge (SGD) is an important pathway for element exchange from the terrestrial to the marine environment and vice versa. The discharging water can not only consist of the fresh groundwater but also of a considerable proportion of recirculated often brackish seawater (Fig. 2).

An extraordinary storm event in early 2019 not only led to the partial flooding of an associated coastal peatland with brackish water but also pushed Baltic Sea water into the coastal aquifers allowing to investigate the time-dependent return to previous subterrestrial 'normal' conditions via SGD-induced freshening.

**A:** Water isotopes showed heavier signatures right after storm event due to Baltic Sea surface waters being pushed into deeper sediments. The profiles from February 2020 show lighter signature, indicating influence from terrestrial/inland waters.

**B:** Salinity depth profiles are showing gradually freshening of pore water. Fresher, brackish water is pushing out of the coastal aquifer in persistent plume indicating controls by lithology (peat) and the permeability.

**C:** H₂S-concentrations increased shortly after flooding event, suggesting a strong increase in BSR.

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