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Understanding salinisation processes for a restored coastal wetland at the Baltic Sea in Germany using Generalised Additive Models

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This contribution reports on the analysis of monitoring data for a 490 ha coastal wetland called Hütelmoor at the Baltic Sea in Germany. Protection measures against sand erosion on the adjacent coastline began in 1963 and stopped seawater intrusions. The wetland was intensively drained and agriculturally used from 1970 until 1989. During the last 25 years, a realignment scheme was implemented which included the termination of beach and dune nourishment, drainage measures as well as agricultural activity. From 2011, water levels and the electrical conductivity were measured for several monitoring wells in the area to better understand the re-salinisation and re-wetting processes including its implications for the development of habitat for flora and fauna. Time series of electrical conductivity were analysed using Generalised Additive Models with additional data on the hydraulic gradient between the water levels in the observation wells and the Baltic sea, rainfall and potential evapotranspiration. Using this analysis, we were able to separate out different processes governing groundwater salinity for the Hütelmoor including dilution from groundwater recharge and seawater intrusion.