

TOPSOIL – GROUNDWATER SALINIZATION AND – MANAGEMENT WITHIN CLIMATE CHANGE

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Topsoil has been an EU project, funded within the scope of the Interreg North Sea Region Programme 2014-2020, with a focus on the effects of climate change on the groundwater regime. The main goal during the project duration from 12/2015 until 12/2021 was to strengthen the resilience of the north sea region on these effects.

The LBEG as geological survey of Lower Saxony focused on changes in the fresh-/saltwater distribution and groundwater retention via Managed Aquifer Recharge (González et al. 2021a). Therefore, a detailed geological model of the quaternary sediments has been set up. The model contains 19 geological units modelled as base layers. In the next step, airborne electromagnetic data (HEM data) (Siemon et al. 2001, Siemon et al. 2013 & Siemon et al. 2017) were integrated to model the compression zone of the Saalian age Lamstedt push moraine. Several clayey to silty slices could be identified and modelled based on the HEM data. Afterwards, HEM data and groundwater analysis were combined to model the fresh-/saltwater interface within the study area (González et al. 2021b).

A groundwater flow model was built up based on the geological model to evaluate the impact of the climate change (considering sealevel rise, changing groundwater recharge rates & future development of water demands) on the groundwater system, especially the fresh-/saltwater distribution. In the second project part, the effect of seasonal Managed Aquifer Recharge (MAR) on the water budget and the fresh-/saltwater distribution has been analyzed. We used a small scale

2D-flow model, trying to reproduce the geology in a very detailed way and run several combinations of recharge time and water amount. The result showed several positive aspects of injecting rainwater or fresh drainagewater. Sustainable water availability in dry periods as well as the seaward push back of the fresh-/saltwater interface are an important contribution towards a climate adapted groundwater management.

González, E., Deus, N., Elbracht, J., Siemon, B., Steuer, A. & Wiederholt, H., 2021a. Modellierung der küstennahen Grundwasserversalzung in Niedersachsen abgeleitet aus aeroelektromagnetischen Daten. *Grundwasser – Zeitschrift der Fachsektion Hydrogeologie*. <https://doi.org/10.1007/s00767-020-00472-w>.
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