Publications

A list of all Deltares publications on salinisation topics is shown below. Quickly navigate to publications within themes infrastructure, groundwater or surface water.

INTEGRAL

INFRA

Articles >>

- O'Mahoney, T.S.D., Oldenziel, G., van der Ven, P., The effect of bubble size on lock-exchange density currents through bubble screens, (submitted to Journal of Hydraulic Engineering)
- Nogueira, H. I. S., van der Hout, A., O'Mahoney, T. S. D., Kortlever, W., Sea locks: the impact of density differences on the hydraulic design of the levelling system. The case of the new large sea locks in IJmuiden and Terneuzen (to be submitted to Journal of Waterways, Ports, Ocean and Coastal Engineering).

Reports >>

- PIANC Report N°198 (2021). "Saltwater Intrusion Mitigation in Inland Waterways". The World Association for Waterborne Transport Infrastructure.
- Kerstma, J., Kolkman, P.A., Regeling, H.J., Venis, W.A. (1990). "Water quality control at ship locks: prevention of salt- and fresh water exchange". A.A. Balkema Publishers, Rotterdam.

GROUND

Articles >>

- Bakx, W., Bense, V.F., Karaoulis, M., Oude Essink, G.H.P., Bierkens, M.F.P., 2023. Measuring groundwater flow velocities near drinking water extraction wells in unconsolidated sediments. 15 (10), Water (Switzerland), https://doi.org/10.3390/w15122167
- Delsman, J.R., Mulder, T., Verastegui, B.R., Bootsma, H., Zitman, P., Huizer, S., Oude Essink, G.H.P., 2023. Reproducible construction of a high-resolution national variable-density groundwater salinity model for the Netherlands. Environ. Model. Softw. 105683. https://doi.org/10.1016/j.envsoft.2023.105683
- Seibert, S.L., Greskowiak, J., Bungenstock, F., Freund, H., Karle, M., Meyer, R., Oude Essink, G.H.P., Van Engelen, J., Massmann, G., 2023. Paleo-hydrogeological modeling to understand present-day groundwater salinities in a low-lying coastal groundwater system (Northwestern Germany). Water Resources Research, https://doi.org/10.1029/2022WR033151
- Van Engelen, J., Oude Essink, G.H.P., Bierkens, M.F.P., 2022. Sustainability of fresh groundwater resources in fifteen major deltas around the world. Environ. Res. Lett. 113650. https://doi.org/10.1088/1748-9326/aca16c
- Karaoulis, M., Ritsema, I., Bremmer, C., De Kleine, M., Oude Essink, G.H.P., Ahlrichs, E., 2022. DroneBorne Electromagnetic (DR-EM) Surveying in The Netherlands: Lab and Field Validation Results. Water (Switzerland) 5335, 1–20. https://doi.org/https://doi.org/10.3390/rs14215335
- Pauw, P.S., Van den Ham, J., Heinis, F., Willeman, R., Essink, G.O., Pefkos, M., Jansen, R.T.H., Oude Essink, G.H.P., Pefkos, M., Jansen, R.T.H., 2022. Groundwater salinity monitoring using a new fiber optic sensor. Groundw. Monit. Remediat. 1–2. https://doi.org/10.1111/gwmr.12532
- Aydin, B.E., Oude Essink, G.H.P., Delsman, J.R., Van de Giesen, N., Abraham, E., 2022. Nonlinear model predictive control of salinity and water level in polder networks: Case study of Lissertocht catchment. Agric. Water Manag. 264, 11. https://doi.org/10.1016/j.agwat.2022.107502
- Zamrsky, D., Oude Essink, G.H.P., Sutanudjaja, E.H., Van Beek, L.P.H., Bierkens, M.F.P., 2022. Offshore fresh groundwater in coastal unconsolidated sediment systems as a potential fresh water source in the 21st century. Environ. Res. Lett. 17. https://doi.org/10.1088/1748-9326/ac4073
- King, J., Mulder, T., Oude Essink, G.H.P., Bierkens, M.F.P., 2022. Joint estimation of groundwater salinity and hydrogeological parameters using variable-density groundwater flow, salt transport modelling and airborne electromagnetic surveys. Adv. Water Resour. 160, 104118. https://doi.org/10.1016/j.advwatres.2021.104118
- Thorslund, J., Bierkens, M.F.P., Oude Essink, G.H.P., Sutanudjaja, E.H., Van Vliet, M.T.H., 2021. Common irrigation drivers of freshwater salinisation in river basins worldwide. Nat. Commun. https://doi.org/10.1038/s41467-021-24281-8.
- Gunnink, J., Pham, H. Van, Oude Essink, G.H.P., Bierkens, M.F.P., 2021. The 3D groundwater salinity distribution and fresh groundwater volumes in the Mekong Delta, Vietnam, inferred from geostatistical analyses. Earth Syst. Sci. Data 13, 3297–3319. https://doi.org/10.5194/essd-13-3297-2021.
- Verkaik, J., Van Engelen, J., Huizer, S., Bierkens, M.F.P., Lin, H.X., Oude Essink, G.H.P., 2021. Distributed memory parallel computing of three-dimensional variable-density groundwater flow and salt transport. Adv. Water Resour. 154, 103976. https://doi.org/10.1016/j.advwatres.2021.103976.
- Verkaik, J., Hughes, J.D., Van Walsum, P.E.V., Oude Essink, G.H.P., Lin, H.X., Bierkens, M.F.P., 2021. Distributed memory parallel groundwater modeling for the Netherlands Hydrological Instrument. Environ. Model. Softw. 143, 105092. https://doi.org/10.1016/j.envsoft.2021.105092
- Willet, J., Wetser, K., Dykstra, J.E., Bianchi, A.B., Oude Essink, G.H.P., Rijnaarts, H.H.M., 2021. WaterROUTE: a model for cost optimization of industrial water supply networks when using water resources with varying salinity. Water Res. 117390. https://doi.org/10.1016/j.watres.2021.117390
- Van Engelen, J., Bierkens, M.F.P., Delsman, J.R., Oude Essink, G.H.P., 2021. Factors determining the natural fresh-salt groundwater distribution in deltas. Water Resour. Res. https://doi.org/10.1029/2020WR027290 Van Engelen et al._2020_Factors determining the natural freshsalt groundwater distribution in deltas.pdf
- Karamouz, M., Mahmoodzadeh, D., Oude Essink, G.H.P., 2020. A risk-based groundwater modeling framework in coastal aquifers: a case study on Long Island , New York , USA. Hydrogeology Journal. https://doi.org/https://doi.org/10.1007/s10040-020-02197-9
- Willet, J., King, J., Wetser, K., Dykstra, J.E., Oude Essink, G.H.P., Rijnaarts, H.H.M., 2020. Water supply network model for sustainable industrial resource use a case study of Zeeuws-Vlaanderen in the Netherlands. Water Resour. Ind. 24, 100131. https://doi.org/10.1016/j.wri.2020.100131

- King, J., Oude Essink, G.H.P., Karaolis, M., Bierkens, M.F.P., 2020. A practical quantification of error sources in regional-scale airborne groundwater salinity mapping. Environ. Res. Lett. 1–18. https://iopscience.iop.org/article/10.1088/1748-9326/ab7b23
- Zamrsky, D., Karssenberg, M.E., Cohen, K.M., Bierkens, M.F.P., Oude Essink, G.H.P., 2020. Geological heterogeneity of coastal unconsolidated groundwater systems worldwide and its influence on offshore fresh groundwater occurrence. Front. Earth Sci. 7, 1–23. https://doi.org/10.3389/feart.2019.00339
- Haasnoot, M., Kwadijk, J.C.J., Van Alphen, J., Le Bars, D., Van den Hurk, B., Diermanse, F., Der Van Spek, A., Oude Essink, G.H.P., Delsman, J. R., Mens, M. 2019. Adaptation to uncertain sea-level rise; how uncertainty in Antarctic mass-loss impacts the coastal adaptation strategy of the Netherlands. Environ. Res. Lett. https://iopscience.iop.org/article/10.1088/1748-9326/ab666c
- Van Engelen, J., Verkaik, J., King, J., Nofal, E. R., Bierkens, M. F. P., Oude Essink, G. H. P. 2019: A three-dimensional palaeohydrogeological reconstruction of the groundwater salinity distribution in the Nile Delta Aquifer, Hydrol. Earth Syst. Sci., 23, 5175–5198, https://doi.org/10.5194/hess-23-5175-2019.
- Mabrouk, M., Jonoski, A., Oude Essink, G.H.P., Uhlenbrook, S., 2019. Assessing the fresh-saline groundwater distribution in the Nile Delta Aquifer using a 3D variable-density groundwater flow model. Water (Switzerland) 1–22., 11, 1946 doi:10.3390/w11091946
- Huizer, S., Luijendijk, A.P., Bierkens, M.F.P., Oude Essink, G.H.P., 2019. Global potential for the growth of fresh groundwater resources with large beach nourishments. Sci. Rep. 1–14. https://doi.org/10.1038/s41598-019-48382-z
- Bakx, W., Doornenbal, P.J., Weesep, R.J., Bense, V.F., Oude Essink, G.H.P., Bierkens, M.F.P. 2019. Determining the Relation between Groundwater Flow Velocities and Measured Temperature Differences Using Active Heating-Distributed Temperature Sensing. *Water, 11*, 1619. https://doi.org/10.3390/w11081619
- Aydin, B.E., Hagedooren, H., Rutten, M., Delsman, J., Oude Essink, G.H.P., Abraham, E., 2019. A Greedy Heuristic for Optimal Sensor Placement for Estimating Salinity in a Polder. Water (Switzerland) 11, 1–14. https://doi.org/10.3390/w11051101
- Hung Van Pham, Van Geer, F.C., Bui Tran, V., Dubelaar, W.,Oude Essink, G.H.P. 2019. Paleo-hydrogeological reconstruction of the fresh-saline groundwater distribution in the Vietnamese Mekong Delta since the late Pleistocene. Journal of Hydrology: Regional Studies, *23*(February), 100594. https://doi.org/10.1016/j.ejrh.2019.100594.
- De Louw, P.G.B., Oude Essink, G.H.P., Delsman, J.R., Van Baaren, E.S., America, I., Van Engelen, J., 2019. Het langetermijngeheugen van de zoet-zoutverdeling. Stromingen 33, 43–60. link
- Aydin, B.E., Tian, X., Delsman, J., Oude Essink, G.H.P., Rutten, M., Abraham, E., 2019. Optimal Salinity and Water Level Control of Polder Ditches using Model Predictive Control. Environ. Model. Softw. doi:10.1016/j.envsoft.2018.11.010
- Mabrouk, M., Jonoski, A., Oude Essink, G.H.P., Uhlenbrook, S., 2018. Impacts of Sea Level Rise and Groundwater Extraction Scenarios on Fresh Groundwater Resources in the Nile Delta Governorates, Egypt. Water 10, 1690. doi:10.3390/w10111690
- King, J., Oude Essink, G.H.P., Karaolis, M., Siemon, B., Bierkens, M.F.P., 2018. Quantifying inversion algorithms using airborne frequency domain electromagnetic data – applied at the Province of Zeeland, the Netherlands. Water Resour. Res. 2060, 1–22. doi:10.1029/2018WR023165
- Zamrsky, D., Oude Essink, G.H.P., Bierkens, M.F.P.: 2018. Estimating the thickness of unconsolidated coastal aquifers along the global coastline, Earth Syst. Sci. Data, 10, 1591-1603, https://doi.org/10.5194/essd-10-1591-2018
- Delsman, J., Van Baaren, E.S., Siemon, B., Dabekaussen, W., Karaoulis, M.C., Pauw, P., Vermaas, T., Bootsma, H., De Louw, P.G.B., Gunnink, J.L., Dubelaar, W., Menkovic, A., Steuer, A., Meyer, U., Revil, A., Oude Essink, G.H.P., 2018. Large-scale, probabilistic salinity mapping using airborne electromagnetics for groundwater management in Zeeland, the Netherlands. Environ. Res. Lett. 13. doi:10.1088/1748-9326/aad19e *Delsman_2018_Environ._Res._Lett._13_084011.pdf*
- Post, V.E.A., Oude Essink, G.H.P., Szymkiewicz, A., Bakker, M., Houben, G., Custodio, E., Voss, C., 2018, Celebrating 50 years of SWIMs (Salt Water Intrusion Meetings). Hydrogeology, 26:1767–1770. https://doi-org.proxy.library.uu.nl/10.1007/s10040-018-1800-8
- Van Engelen, J., Oude Essink, G. H. P., Kooi, H., and Bierkens, M. F. P. 2018. On the origins of hypersaline groundwater in the Nile Delta aquifer. Journal of Hydrology, 560, 301-317. https://doi.org/10.1016/j.jhydrol.2018.03.029
- Huizer, S., Radermacher, M., de Vries, S., Oude Essink, G. H. P., and Bierkens, M. F. P. 2018. Impact of coastal forcing and groundwater recharge on the growth of a fresh groundwater lens in a mega-scale beach nourishment, Hydrol. Earth Syst. Sci., 22, 1065-1080, https://doi.org/10.5194/hess-22-1065-2018.
- Huizer, S., Karaoulis, M.C., Oude Essink, G.H.P., Bierkens, M.F.P., 2017, Monitoring and simulation of salinity changes in response to tide and storm surges in a sandy coastal aquifer system, Water Resources Research, doi: 10.1002/2016WR020339
- Revil, A., Coperey, A., Shao, Z., Florsch, N., Fabricius, I.L.L., Deng, Y., Delsman, J.R., Pauw, P.S., Karaoulis, M., De Louw, P.G.B., Van Baaren, E.S., Dabekaussen, W., Menkovic, A., Gunnink, J.L. 2017. Complex conductivity of soils. Water Resources Research, 53(8), 7121–7147. https://doi.org/10.1002/2017WR020655 *Revil_et_al-2017-Water_Resources_Research.pdf*
- Delsman, J.R., De Louw, P.G.B., De Lange, W.J., Oude Essink, G.H.P., 2017, Fast calculation of groundwater exfiltration salinity in a lowland catchment using a lumped celerity / velocity approach, Environmental Modelling and Software, 96, 323–334, doi: 10.1016/j.envsoft.2017.07.004 *2017_Delsman_etal_1-s2.0-S1364815217301470-main.pdf*
- Eeman, S., De Louw, P.G.B., van der Zee, S.E.A.T.M., 2017. Cation exchange in a temporally fluctuating thin freshwater lens on top of saline groundwater. Hydrogeol. J. 25, 223–241. doi:10.1007/s10040-016-1475-y.
- Huizer, S., Oude Essink, G.H.P., Bierkens, M.F.P., 2016, Fresh groundwater resources in a large sand replenishment, Hydrol. Earth Syst. Sci., 20, 3149-3166, doi:10.5194/hess-20-3149-2016. *2016_Huizer_hess-20-3149-2016.pdf*
- Stofberg, S.F., Oude Essink, G.H.P., Pauw, P., De Louw, P.G.B., Leijnse, A., van der Zee, S.E.A.T.M., 2016, Fresh Water Lens Persistence and Root Zone Salinization Hazard Under Temperate Climate, Water Resources Management, doi: 10.1007/s11269-016-1315-9. *2016_Stofberg_etal_FWL_art%3A10.1007%2Fs11269-016-1315-9.pdf*
- Delsman, J. R., Winters, P., Vandenbohede, A., Oude Essink, G. H.P. and Lebbe, L., 2016, Global sampling to assess the value of diverse observations in conditioning a real-world groundwater flow and transport model. Water Resour. Res. doi:10.1002/2014WR016476.*Delsman_et_al-2016-Water_Resources_Research.pdf*
- Pauw P.S., van der Zee S.E.A.T.M., Leijnse A., Oude Essink G.H.P., 2015, Saltwater Upconing Due to Cyclic Pumping by Horizontal Wells in Freshwater Lenses. *Ground Water, Vol 54 (4), 521-531*. doi: 10.1111/gwat.12382.
- Pauw, P.S., Van Baaren, E.S., Visser, M. De Louw, P.G.B., Oude Essink, G.H.P., 2015, Increasing a freshwater lens below a creek ridge using a controlled artificial recharge and drainage system: a case study in the Netherlands, *Hydrogeology Journal*. doi: 10.1007/s10040-015-1264-z. *2015_Pauw_etal_CARD.pdf*
- De Louw, P.G.B., Oude Essink, G.H.P., Eeman, S., Van Baaren, E.S., Vermue, E., Delsman, J.R., Pauw, P.S., Siemon, B., Gunnink, J.L., Post, V. E.A., 2015, Dunne regenwaterlenzen in zoute kwelgebieden, *Landschap*, 32, 5-15.*Landschap 1-2015 De Louw.pdf*
- Zeghici, R.M., Oude Essink, G.H.P., Hartog, N., Sommer, W., 2015, Integrated assessment of variable density–viscosity groundwater flow for a high temperature mono-well aquifer thermal energy storage (HT-ATES) system in a geothermal reservoir. Geothermics, 55, 58–68. doi: 10.1016/j.geothermics.2014.12.006.
- Pauw, P.S., van der Zee, S.E.A.T.M., Leijnse, A., Delsman, J.R., De Louw, P.G.B., de Lange, W.J., Oude Essink, G.H.P. 2015. Low-Resolution Modeling of Dense Drainage Networks in Confining Layers, *Ground water,* 1-11, doi: 10.1111/gwat.12273
- Delsman, J.R., Waterloo, M.J., Groen, M.M.A. Groen, J., Stuyfzand, P.J. 2014 Investigating summer flow paths in a Dutch agricultural field using high frequency direct measurements, *J. Hydrology*, doi: 10.1016/j.jhydrol.2014.10.058
- De Lange, W.J., Prinsen, G.F., Hoogewoud, J.C., Veldhuizen, A., Verkaik, J., Oude Essink, G.H.P., van Walsum, P.E.V., Delsman, J.R., Hunink, J.C., Massop, H.T.L., Kroon, T., 2014. An operational, multi-scale, multi-model system for consensus-based, integrated water management and policy analysis: The Netherlands Hydrological Instrument. *Environmental Modelling & Software* 59, 98–108, doi: 10.1016/j.envsoft.2014.05.009.

- Pauw, P.S., Oude Essink, G.H.P., Leijnse, A., Vandenbohede, A., Groen, J., van der Zee, S.E.A.T.M. 2014. Regional scale impact of tidal forcing on groundwater flow in unconfined coastal aquifers, *J. Hydrology*, 517, 269–283, doi: 10.1016/j.jhydrol.2014.05.042
- Delsman, J.R., Hu-a-ng, K.R.M., Vos, P.C., de Louw, P.G.B., Oude Essink, G.H.P., Stuyfzand, P.J., & Bierkens, M.F.P. 2014. Paleo-modeling of coastal saltwater intrusion during the Holocene: an application to the Netherlands. *Hydrology and Earth System Sciences*, *18*(10), 3891–3905, doi: 10.5194/hess-18-3891-2014.
- Vandenbohede, A., de Louw, P.G.B., Doornenbal, P.J.P.J., 2014. Characterizing preferential groundwater discharge through boils using temperature. Journal of Hydrology 510, 372–384, doi: 10.1016/j.jhydrol.2014.01.006
- De Louw, P.G.B., Eeman, S., Oude Essink, G.H.P., Vermue, E., Post, V.E.A. 2013. Rainwater lens dynamics and mixing between infiltrating rainwater and upward saline groundwater seepage beneath a tile-drained agricultural field. J. Hydrology, 501, 133-145, doi: 10.1016/j.jhydrol.2013.07.026
- Delsman, J.R., Oude Essink, G.H.P., Beven, K.J., Stuyfzand, P.J. 2013. Uncertainty estimation of end-member mixing using generalized likelihood uncertainty estimation (GLUE), applied in a lowland catchment, *Water Resour. Res.*, 49 , 4792 – 4806, doi: 10.1002/wrcr.20341.
- De Louw, P.G.B., Vandenbohede, A., Werner, A.D., Oude Essink, G.H.P. 2013. Natural saltwater upconing by preferential groundwater discharge through boils. J. Hydrol., 490, 74-87, doi: 10.1016/j.jhydrol.2013.03.025
- Faneca Sànchez , M., Gunnink , J.L., van Baaren , E.S., Oude Essink , G.H.P., Siemon, B. , Auken, E. , Elderhorst, W. , de Louw, P.G.B. 2012. Modelling climate change effects on a Dutch coastal groundwater system using airborne Electro Magnetic measurements, *Hydrol. Earth Syst. Sci.*, 16, 4499-4516, doi: 10.5194/hess-16-4499-2012.
- Pauw, P.S., Louw, P.G.B., de, Oude Essink, G.H.P. 2012. Groundwater salinization in the Wadden Sea area of the Netherlands; quantifying the effects of climate change, sea level rise and anthropogenic interferences, *Netherlands Journal of Geosciences* 91-3, 373-383, doi: 10.1017/S0016774600000500
- Harbo, M.S., Pedersen, J. Johnsen., R. and Petersen, K. 2012. (Eds) The CLIWAT handbook: Groundwater in a future climate, www.cliwat.eu. 184 p.
- Oude Essink, G.H.P. and Kooi, H. 2012. Land-subsidence and sea-level rise threaten fresh water resources in the coastal groundwater system of the Rijnland water board, The Netherlands, p. 227-248, Chapter 13 in: Climate Change Effects on Groundwater Resources: A Global Synthesis of Findings and Recommendations, Treidel, H., Martin-Bordes, J.L. and Gurdak, J.J. (Eds), 401 p.
- Louw, P.G.B., de, Eeman, S., Siemon, B., Voortman, B.R., Gunnink, J., van Baaren, E.S., and Oude Essink, G.H.P., 2011, Shallow rainwater lenses in deltaic areas with saline seepage, *Hydrol. Earth Syst. Sci.*, 15, 3659-3678, doi: 10.5194/hess-15-3659-2011.
- Louw, P.G.B., de, van der Velde, Y., and van der Zee, S.E.A.T.M. 2011. Quantifying water and salt fluxes in a lowland polder catchment dominated by boil seepage: a probabilistic end-member mixing approach, *Hydrol. Earth Syst. Sci.*, 15, 2101-2117, doi: 10.5194/hess-15-2101-2011.
- Louw, P.G.B., de, Oude Essink, G.H.P., Stuyfzand, P.J., Zee, van der, S.E.A.T.M. 2010. Upward groundwater flow in boils as the dominant mechanism of salinization in deep polders, The Netherlands, *J. Hydrol.* 394, 494-506, doi: 10.1016/j.jhydrol.2010.10.009
- Oude Essink, G.H.P., E.S. van Baaren, and P.G.B. de Louw. 2010. Effects of climate change on coastal groundwater systems: A modeling study in the Netherlands, *Water Resour. Res.*, 46, W00F04, doi: 10.1029/2009WR008719.
- Goes, B.J.M., Oude Essink, G.H.P., Vernes, R.W. and Sergi, F. 2009. Estimating the depth of fresh and brackish groundwater in a predominantly saline region using geophysical and hydrological methods, Zeeland, the Netherlands, *Near Surface Geophysics* 401-412, doi: 10.3997/1873-0604.2009048.
- Giambastiani, B.M.S., Antonellini, M., Oude Essink, G.H.P. and Stuurman, R.J. 2007. Saltwater intrusion and water management in the unconfined coastal aquifer of Ravenna (Italy): a numerical model, *J. of Hydrol.* (340), 1-2, 91-104, doi: 10.1016/j.jhydrol.2007.04.001.
- De Louw, P. and Oude Essink, G.H.P. 2006. Salinisation of the Northern coastal area of the Netherlands due to land subsidence and sea level rise. In: Jun Xu, Y. and Singh, V.P. (Eds.): Coastal Environmental and Water Quality, AIH Annual Meeting & International Conference, Challenges in Coastal Hydrology and Water Quality, Baton Rouge, Louisiana, 167-179.
- Langevin, C.D., G.H.P. Oude Essink, Panday, S., Bakker, M., Prommer, H., Swain, E.D., Jones, W., Beach, M. and Barcelo, M. 2003. MODFLOW-Based Tools for Simulation of Variable-Density Groundwater Flow. In: Coastal Aquifer Management-Monitoring, Modeling and Case Studies. A.H.-D. Cheng and D. Ouazar, CRC Press, 30-76.
- Bakker, M., Oude Essink, G.H.P. and Langevin, C.D. 2004. The rotating movement of three immiscible fluids, *J. of Hydrol.* (287), 270-278, doi: 10.1016/j.jhydrol.2003.10.007.
- Bouw, L. and Oude Essink, G.H.P. 2003. Development of a freshwater lens in the inverted Broad Fourteens Basin, Netherlands offshore, *J. of Geochemical Exploration* 78-79: 321-325, doi: 10.1016/S0375-6742(03)00113-4.
- Bouw, L. and Oude Essink, G.H.P. 2003. Fluid flow during Late Cretaceous inversion of the northern Broad Fourteens Basin, Netherlands *J. of Geosciences* 82 (1): 55-69.
- Oude Essink, G.H.P. 2001. Salt Water Intrusion in a Three-dimensional Groundwater System in The Netherlands: a Numerical Study, *Transport in Porous Media* 43(1): 137-158, doi: 10.1023/A:1010625913251
- Oude Essink, G.H.P. 2001. Improving fresh groundwater supply - problems and solutions. *Ocean & Coastal Management* 44: 429-449, doi: 10.1016/S0964-5691(01)00057-6
- Oude Essink, G.H.P. 2001. Saltwater intrusion in 3D large-scale aquifers: a Dutch case, *Phys. & Chem. of the Earth* 26(4): 337-344, doi: 10.1016/S1464-1909(01)00016-8.
- Oude Essink, G.H.P. 2001. Density dependent groundwater flow at the island of Texel, The Netherlands. Proc. 16th Salt Water Intrusion Meeting, Miedzyzdroje-Wolin Island, Poland: 47-54.
- Klein, R.J.T., R.J. Nicholls, G.H.P. Oude Essink, N. Minura and R.A. Warrick. 1998. Coastal Zones (Chapter 7). Unites Nations Environmental Programme, in UNEP Handbook on Methods for Climate Change Impact Assessments and Adaptation Strategies,. J.F. Feenstra, I. Burton, J.B. Smith and R.S.J. Tol (Eds), CRC Press, 464 p.
- Oude Essink, G.H.P. 1998. MOC3D adapted to simulate 3D density-dependent groundwater flow. In: Proc.MODFLOW'98 Conference, October 4-8, 1998, Golden, Colorado, USA, Vol. I, 291-303.
- Oude Essink, G.H.P. 1996. Impact of sea level rise on groundwater flow regimes. A sensitivity analysis for the Netherlands. Ph.D. thesis, Delft University of Technology. Delft Studies in Integrated Water Management: no. 7 ISBN 90-407-1330-8. 428 p.
- Oude Essink, G.H.P. Boekelman, R.H., 1996. Problems with large-scale modelling of salt water intrusion in 3D, Proc. 14th Salt Water Intrusion Meeting, Malmo, Sweden.
- Jelgersma, S., M. J. Tooley, G.H.P. Oude Essink, R.H. Boekelman, M.C.J. Bosters, W.J. Wolff, K.S. Dijksma, B.J. Ens, L. Bijlsma, R. Hillen, and R. Misdorp. 1993. Sea Level Changes and their Consequences for Hydrology and Water Management, State of the Art Report, UNESCO, IHP-IV Project H-2-2, 135 p.

PhD-theses >>

1. King, J., 2022. Airborne electromagnetic mapping of coastal groundwater salinity; Quantifying uncertainty and investigating methodological improvements, Utrecht University, Utrecht, 188 pp. download PhD thesis
2. Zamrsky, D., 2021. Current and future state of groundwater in coastal unconsolidated sediment systems worldwide, Utrecht University, Utrecht, 238 pp. download PhD thesis

3. Mabrouk, M.B., 2020. Climate Change and Development Impacts on Groundwater Resources in the Nile Delta Aquifer, Egypt. IHE Delft, 150 pp. download PhD thesis
4. Van Engelen, J., 2020. Fresh groundwater reserves in major deltas: Evolution and current state of deltaic groundwater resources, Utrecht University, Utrecht, 194 pp. download PhD thesis
5. Aydin, B.E., 2020. Model Predictive Control of Water Level and Salinity in Coastal Areas. Delft University of Technology, 103 pp. download PhD thesis
6. Huizer, S. 2019. Fresh groundwater in large beach nourishments; Growth of freshwater resources in coastal areas, Utrecht University, Utrecht, 152 pp. download PhD thesis
7. Delsman, J.R. 2015, Saline groundwater - surface water interaction in coastal lowlands, VU University Amsterdam, Amsterdam, 194 pp. download PhD thesis
8. Pauw, P.S. 2015. Field and Model Investigations of Freshwater Lenses in Coastal Aquifers, PhD thesis, Wageningen University, Wageningen, 168 pp. download PhD thesis
9. De Louw, P.G.B. 2013. Saline seepage in deltaic areas. Preferential groundwater discharge through boils and interactions between thin rainwater lenses and upward saline seepage. PhD thesis, Vrije Universiteit Amsterdam, ISBN/EAN 9789461085429. download PhD thesis

Conferences >>

- EGU 2023, Vienna (https://meetingorganizer.copernicus.org/EGU23/session/46604):
    1. Assessing the impact of climate change and anthropogenic factors on future salinization of a low-lying coastal groundwater system (Northwestern Germany), SL Seibert, J Greskowiak, L Karrasch, B Siebenhüner, GHP Oude Essink, et al.
    2. Detailed monitoring and simulation of groundwater salinity in response to extractions in a coastal aquifer system, T Hendrikx, GHP Oude Essink, M Karaoulis, M Bierkens
    3. 3D groundwater salinity mapping of the global coastal zone, GHP Oude Essink, D Zamrsky, J King, J Delsman, J Verkaik, M Bierkens
    4. A study on the suitability and quantitative potential of aquifer storage and recovery and brackish water extraction in Dutch coastal areas, I America-van den Heuvel, J King, H Bootsma, J Delsman, et al.
    5. Effects of surface water boundary condition scaling on modelled groundwater salinity and salt fluxes, I Farias, GHP Oude Essink, P de Louw, MFP Bierkens
    6. New developments in the field of global coastal groundwater salinity modelling and mapping, GHP Oude Essink, D Zamrsky, J King, J Delsman, J Verkaik, M Bierkens
- Groundwater key to the SDGs, Paris, France, 18 May 2023: Oude Essink, G.H.P., Minderhoud, P.S.J., Phm, H.V., Schoonderwoerd, E., De Keijzer, O.; Groundwater (mis)management in sinking and saltier deltas: The Mekong Delta case
- XXIV International Conference on Computational Methods in Water Resources (CMWR), Gdansk, Poland, 20-23 June 2022 (convenor Gu Oude Essink), presentation Joeri van Engelen:
- Stockholm World Water Week, session 31 Augustus 2022 (convenors Schoonderwoerd, E. De Keizer, O., Oude Essink, G.H.P.): Groundwater management: key to resilient deltas for food and nature-
- AGU, Dec 2022 Chicago, Global 3D groundwater salinity mapping and its impacts on public health risks; Gribble O'Madigan, M., Zamrsky, D., Oude Essink, G.H.P., Bierkens, M.F.P., King, J. Delsman, J., Verkaik, J., Wheeler, B., Fleming, L.
- UNESCO conference 8-10 November 2022, Paris, France: 'Management coastal aquifers and related ecosystems in the Mediterranean', presentation 'Ongoing research on salt water intrusion', presenter Oude Essink, G.H.P.
- 17-18 October 2022, Venezia, Italy: Knowledge HUB on sea-level rise, https://knowledgehubsealevelrise.org/, presentation Quantification of groundwater salinization and inland freshwater demand caused by extreme sea level rise in the Netherlands, presenter Oude Essink, G.H.P.

SURFACE

Articles >>

- Kranenburg, W., Tiessen, M., Blaas, M., and van Veen, N. Circulation, stratification and salt dispersion in a former estuary after reintroduction of seawater inflow, submitted to Estuarine, Coastal and Shelf Science
- Dijkstra, Y. H. Schuttelaars, W.M. Kranenburg (2022). Salt transport regimes induced by tides in narrow estuaries, J. Geophys. Res. (Oceans)
- D. Van Keulen, W.M. Kranenburg and T. Hoitink; A new harmonic regression approach to predict estuarine salinity variation subject to storm surge effects, submitted to J. of Geophys. Res. (Oceans) Circulation, stratification and salt dispersion in a former estuary after reintroducing seawater inflow
- Kranenburg, W.M., T. Van der Kaaij, M.Tiessen, Y.Friocourt, M.Blaas (2022). Salt Intrusion in the Rhine Meuse Delta: Estuarine Circulation, Tidal Dispersion or Surge Effect? Proceedings IAHR-World Congress 2022 (paper 1058)

Conferences >>

- Ocean Science Meeting 2022; Kranenburg, Tiessen, Blaas, Van Veen: Circulation, Stratification and Salt Dispersion in a former estuary after reintroduction of seawater inflow
- EGU-2022, Vienna; Wouter Kranenburg, Meinard Tiessen, Meinte Blaas, and Nathalie van Veen: Circulation, stratification and salt dispersion in a former estuary after reintroduction of seawater inflow to improve fish migration
- IAHR-World Congress 2022, Granada; Salt Intrusion in the Rhine Meuse Delta: Estuarine Circulation, Tidal Dispersion or Surge Effect? Wouter Kranenburg, Theo van der Kaaij, Meinard Tiessen, Yann Friocourt and Meinte Blaas