

## CURRICULUM VITAE DR.IR. G.H.P. OUDE ESSINK



**Gualbert Oude Essink, PhD** (Civil Engineering, Delft University of Technology) is senior hydrogeologist at Deltares and associate professor at the Utrecht University. His expertise is on groundwater in the coastal zone, with a focus on 3D modelling variable-density groundwater flow and coupled salt transport. He participates in (inter)national research projects on saltwater intrusion and freshwater lenses under palaeo, anthropogenic, climate change and storm surge conditions; groundwater salinity mapping via airborne electromagnetic surveys; global quick scan freshwater resources, saline groundwater upconing under extraction wells. He works on (applied) research projects in The Netherlands (COASTAR, FRESHEM, NatureCoast (Zandmotor), Egypt (Nile Delta), Singapore (Jurong Island, Managed Aquifer Recharge), Bangladesh (SWIBANGLA) and Vietnam (NWO project Rise and Fall). Recently, he has executed 3D salinity modelling of Dunea, Zeeland and Zuid-Holland. He leads a consortium on promising Aquifer Storage and Recovery solutions for local fresh groundwater supply to reduce drought and salinity stresses in the Province of Zeeland. Gualbert participates in NWO programs on rapid mapping, modeling and operational management of regional salt-fresh water resources (Water Nexus) and on assessing fresh groundwater reserves in 40 major deltas under global and climate change. He gives international courses and keynote lectures, convenes sessions on congresses, teaches since 1999 at IHE Delft, publishes in journals and supervises eight PhD-candidates.

- 1 Position:** Senior Geohydrologist / Groundwater modelling expert
- 2 Name of Firm:** Deltares and Utrecht University (Dept. Physical Geography, Associated Prof.)
- 3 Name of Staff:** Gualbert H.P. Oude Essink
- 4 Date of Birth:** 22-12-1965      **Nationality:** Dutch
- 5 Education:**

1989-1996	PhD. Delft University of Technology, Civil Engineering, Hydrology and Ecology: <i>'Impact of sea level rise on groundwater flow regimes. A sensitivity analysis for the Netherlands'</i>
1989	Two additional exams Civil Engineering: Coastal Engineering and Geohydrology
1984-1989	Delft University of Technology, Civil Engineering, Hydrology
1978-1984	Secondary School The Netherlands (Atheneum-B)
- 6 Membership of Professional Associations:**
  - American Geophysical Union
  - Dutch Hydrological Society
  - Assessor with the Australian Research Council
- 7 Other training:**
  - 2002 Basis qualification teaching. Utrecht University, The Netherlands
  - 2005 Course on Isatis, a flexible geostatistics package for Hydrogeologists
  - 2009 Course Development Leading Professionals
- 8 Countries of Work Experience:**

**Last ten years:** Netherlands, India, Belgium, Italy, Germany, Singapore, Vietnam, Bangladesh, USA, Egypt, Spain
- 9 Languages:**

	<i>writing</i>	<i>speaking</i>	<i>reading</i>
Dutch	Mother tongue	Mother tongue	Mother tongue
English	Excellent	Excellent	Excellent
French	Poor	Fair	Fair
German	Fair	Good	Good
- 10 Employment Record:**

<b>From (year):</b>	2007	<b>To (year):</b>	Date
<b>Employer:</b>	Deltares, Business Unit Soil and Groundwater Systems		
<b>Positions held:</b>	Senior expert in fresh-salt groundwater in the coastal zone, in variable density groundwater modeling, interaction groundwater – surface water, assessing fresh groundwater resources		
<b>From (year):</b>	2014	<b>To (year):</b>	Date
<b>Employer:</b>	Utrecht University, Department of Physical Geography		
<b>Positions held:</b>	Supervising PhDs, guest lectures		
<b>From (year):</b>	2002	<b>To (year):</b>	2007
<b>Employer:</b>	TNO Built Environment and Geosciences. Geological Survey of The Netherlands, Business Unit Groundwater and Soil		
<b>Positions held:</b>	Groundwater modeling; expert in salt-fresh groundwater interaction		
<b>From (year):</b>	1999	<b>To (year):</b>	Date
<b>Employer:</b>	UNESCO-IHE Delft (International Institute for Infrastructural Hydraulic and Environmental Engineering)		
<b>Positions held:</b>	Lecturer: Density dependent groundwater flow		
<b>From (year):</b>	2002	<b>To (year):</b>	2004
<b>Employer:</b>	Free University Amsterdam, Faculty of Earth and Life Sciences, Hydrology and Geo-Environmental Sciences		
<b>Positions held:</b>	Senior expert, work package leader: EC-project CRYSTECHSALIN ( <i>Crystallisation Technologies for Prevention of Salt Water Intrusion</i> )		
<b>From (year):</b>	2001	<b>To (year):</b>	2002
<b>Employer:</b>	Freelance Specialist Hydrology		
<b>Positions held:</b>	Specialist fresh-saline groundwater modelling: case-study of the Water Board Rijnland and the Wieringermeerpolder		
<b>From (year):</b>	1997	<b>To (year):</b>	2002
<b>Employer:</b>	University of Utrecht, Faculty of Earth Sciences		
<b>Positions held:</b>	Assistant Professor Hydrological Transport Processes		
<b>From (year):</b>	1989	<b>To (year):</b>	1996
<b>Employer:</b>	Delft University of Technology, Civil Engineering, Hydrology and Ecology		
<b>Positions held:</b>	PhD-student on ' <i>Impact of sea level rise on groundwater flow regimes. A sensitivity analysis for the Netherlands</i> '.		

### 11 Assignments:

**Name of assignment or project:** LHM salt fresh modelling instrument

**Year:** 2019-2020

**Partners:** Deltares, Arcadis, TNO

**Client:** Rijkswaterstaat, NL

**Main project features:** Data collection and assimilation, model building, parallel computing, validation model, linkage to the existing NHI modelling instrument.

**Positions held:** Scientific reviewer and advisor

**Activities performed:** Responsible for management activities (coordination, reporting), responsible for progress of project, time management

**Name of assignment or project:** Enhancing water efficiency and food security through Egyptian TVET's'

**Year:** 2019-2021

**Partners:** Maastricht School of Management (MSM), Kafrelsheikh University, Areas Applied University, Deltares

**Client:** RVO

**Main project features:** Groundwater issues, related to agriculture. To manage and coordinate activities in the water sector with hydrogeologic testing facilities.

**Positions held:** work package leader water issues

**Activities performed:** Responsible for implementation water issues

**Name of assignment or project:** FAME (Freshwater Availability in the MEkong delta Vietnam)

<p><b>Year:</b> 2018-2020</p> <p><b>Partners:</b> Deltares, WUR, Nelen&amp;Schuurmans, DWRPIS, WACC</p> <p><b>Client:</b> RVO</p> <p><b>Main project features:</b>  FAME (Freshwater Availability in the MEkong delta) entails assessing the feasibility of different water management techniques (i.e. aquifer storage and recovery (ASR), rainwater harvesting and/or surface water storage) that could serve as a bridge between water demand and supply as regards to space and time in the coastal provinces Ben Tre and Tra Vinh, Mekong, Vietnam.</p> <p><b>Positions held:</b> project leader</p> <p><b>Activities performed:</b> Responsible for management activities (coordination, reporting), responsible for progress of project, time management</p>
<p><b>Name of assignment or project:</b> COASTAR (COastal Aquifer STORAGE And Recovery): towards large-scale implementation of Subsurface Water Solutions</p> <p><b>Year:</b> 2017-2021</p> <p><b>Partners:</b> Deltares, KWR Water Research and Arcadis</p> <p><b>Client:</b> Delfland Water Authority, Province of Zuid-Holland, Dunea</p> <p><b>Main project features:</b>  The potential of the subsurface has been analysed to attain a robust and sustainable freshwater supply and combat drought in The Netherlands. COASTAR (COastal Aquifer STORAGE And Recovery) aims at implementing proven subsurface water solutions worldwide. COASTAR brings together a wide range of sectors – drinking water, industry, agriculture, cities – and encourages water reuse. In this first phase, a regional Master Plan aims to ensure self-sufficiency in the water supply for the economically vibrant region of The Hague – Westland – Rotterdam.</p> <p><b>Positions held:</b> senior advisor, expert modeller variable-density groundwater flow and coupled salt transport</p> <p><b>Activities performed:</b> Working on working packages T1 (reference situation of The Hague – Westland – Rotterdam), international upscaling Subsurface Water Solutions</p>
<p><b>Name of assignment or project:</b> Consulting Services for Study on the Impact of the GERD on Egypt: understanding salinisation processes in the Nile Delta, Egypt, as well as in a context of climate and global change, using a 3D fresh-saline groundwater model</p> <p><b>Year:</b> 2015-2018</p> <p><b>Client:</b> Ministry of Water Resources and Irrigation, Enhanced Water Resources Management Project (WorldBank, Mott MacDonald), Research Institute Groundwater (RIGW, Egypt)</p> <p><b>Main project features:</b>  The salinisation of the precious fresh groundwater resources in the Nile Delta due to salt water intrusion and extensive groundwater use is a major concern for Egyptian water users and managers. Groundwater is used for irrigation, industrial and drinking purposes. Sea-level rise and the ongoing increase in the use of groundwater and surface water are expected to have a further negative effect on the groundwater system. On top, the GERD is expected to influence the salinity balance in the Delta. We constructed a 3D regional model for variable-density groundwater flow and coupled salt transport for the Nile Delta aquifer system using the latest data. The objective is to use the model as a water management tool for different climate and water management scenarios. More specifically, RIGW is interested in the impact on fresh-saline groundwater and the head distribution in the Nile Delta of: a. sea-level rise and b. changing the existing groundwater extraction rates.</p> <p><b>Positions held:</b> expert modeller variable-density groundwater flow and coupled salt transport</p> <p><b>Activities performed:</b> Responsible for salinity groundwater modelling in the Nile Delta Aquifer System</p>
<p><b>Name of assignment or project:</b> Fresh groundwater reserves in 40 major deltas under global and climate change, <a href="#">link</a></p> <p><b>Year:</b> 2016-2019</p> <p><b>Client:</b> NWO (Netherlands Organisation for Scientific Research)</p> <p><b>Main project features:</b></p> <ul style="list-style-type: none"> <li>• Looking at the impact of over-exploitation and climate change on global fresh groundwater reserves</li> <li>• Coupling the variable-density groundwater flow model code iMOD-SEAWAT to the global hydrological model PCR-GLOBW</li> <li>• Sensitivity analysis based on a large set of synthetic deltas and setting up local fresh-brackish-salt groundwater distributions of Rhine, Ganges-Brahmaputra and Mekong</li> <li>• Mapping and estimating the current and future fbs-gwds in 40 deltas, based on determining factors</li> </ul>

<ul style="list-style-type: none"> <li>Analysing measures to safeguard or increase fresh groundwater reserves</li> </ul> <p><b>Positions held:</b> Co-promotor PhD, daily supervision</p> <p><b>Activities performed:</b> Responsible for modelling tools and giving direction to research</p>
<p><b>Name of assignment or project:</b> Water Nexus - Salt water where possible, fresh water where necessary; salt-containing water as a new driver for economy in delta areas: project Resource analysis and regional water management</p> <p><b>Year:</b> 2015-2018</p> <p><b>Client:</b> NWO STW (Netherlands Organisation for Scientific Research)</p> <p><b>Main project features (3 PhD topics):</b></p> <ul style="list-style-type: none"> <li>PhD1: Rapid modelling and scenarios for strategic policy development: developing a toolbox for quick and comprehensive model construction and scenario development, enabling characterization and identification of vulnerabilities and opportunities for water distribution control, and the robustness of the water system against autonomous and anthropogenic changes.</li> <li>PhD2: Rapid mapping of salt-fresh water distributions: combining readily available global data and (a minimum of) earthbound data into models for accurate monitoring and prediction of spatial distribution</li> <li>PhD3: Operational management of regional salt-fresh water resources</li> </ul> <p><b>Positions held:</b> Co-promotor three PhDs, daily supervision</p> <p><b>Activities performed:</b> Responsible for modelling tools and giving direction to research</p>
<p><b>Name of assignment or project:</b> Rise and fall: strategies for the subsiding and urbanising Mekong Delta (Vietnam) facing increasing water levels, land subsidence and salt water intrusion</p> <p><b>Year:</b> 2014-2018</p> <p><b>Client:</b> NWO (Netherlands Organisation for Scientific Research)</p> <p><b>Main project features:</b> to enhance the capabilities of individuals and organisations to develop sustainable strategies for dealing with groundwater extraction, land subsidence and salt water intrusion in the increasingly urbanising Mekong Delta.</p> <p><b>Positions held:</b> Work package leader and Co-promotor PhD on salt water intrusion in groundwater</p> <p><b>Activities performed:</b> Responsible for coupling modelling tools on land subsidence and salt water intrusion</p>
<p><b>Name of assignment or project:</b> SWIBANGLA: mitigating salt water intrusion in the coastal zone of Bangladesh</p> <p><b>Year:</b> 2013-2014</p> <p><b>Client:</b> IRC (International Water and Sanitation Centre)</p> <p><b>Main project features:</b> The goal of the project is to investigate the impacts of salt water intrusion in Bangladesh, the main salinization processes, possible mitigation strategies, and the needed tools to provide input to the Water Safety Plans (WSP). The main outcomes of the project are: Key components on salinization issues for Water Safety Plans, suitable mitigation strategies to mitigate the impacts of salt water intrusion, a regional 3D variable-density dependent groundwater model, a Water Quality Monitoring kit, a Smart Phone App to measure Electrical Conductivity, Leaflets containing salinization processes information and Workshops on Modeling and Monitoring.</p> <p><b>Positions held:</b> Scientific reviewer</p> <p><b>Activities performed:</b> Responsible for management activities (coordination, reporting), responsible for progress of project, supervising modelling, time management</p>
<p><b>Name of assignment or project:</b> NatureCoast: Understanding of the hydrogeological processes that are associated with mega-nourishments</p> <p><b>Year:</b> 2013-2017</p> <p><b>Client:</b> NWO STW Perspectief 2012</p> <p><b>Main project features:</b> monitoring and modelling the expected changes in the distribution of fresh and salt groundwater in the Sand Engine (a mega- nourishment off the coastline of South-Holland); mapping potential locations of fresh groundwater reserves along coastlines worldwide</p> <p><b>Positions held:</b> Co-promotor Hydrogeology PhD (Sebastian Huizer)</p> <p><b>Activities performed:</b> Daily Supervision PhD</p>
<p><b>Name of assignment or project:</b> Exploring groundwater resources on Jurong Island, Singapore</p> <p><b>Year:</b> 2013-2014</p> <p><b>Client:</b> PUB (Public Utilities Board)</p> <p><b>Main project features:</b> assessing the feasibility of extracting fresh groundwater water from Jurong Island, assessing the change of the fresh-salt water interface for different scenarios, including a subsidence module.</p> <p><b>Positions held:</b> Hydrogeological expert, advisor numerical modelling variable-density groundwater</p> <p><b>Activities performed:</b> Modelling salt water intrusion and assessing risks of upconing</p>

<p><b>Name of assignment or project:</b> Measures local freshwater supply SouthwesternDelta  <b>Year:</b> 2012-2017  <b>Location:</b> Province of Zeeland, The Netherlands  <b>Client:</b> Knowledge for Climate  <b>Main project features:</b> GO-FRESH: Geohydrological Opportunities FRESH water supply  Main goal within GO-FRESH is to improve the use of existing fresh groundwater resources and create new freshwater reserves, thereby increasing regional self-sufficiency and reducing dependence on external freshwater supply. Building on research considering the theoretical feasibility of measures, the research goals are: to investigate which measures actually 'work' in practice, to upscale the existing Aquifer Storage and Recovery showcases to other areas, and to analyse whether such measures are economically feasible. The promising technologies are:</p> <ul style="list-style-type: none"> <li>• Showcase 'The Freshmaker'; aquifer storage and recovery (ASR) utilizing the potential of sandy creek ridges for water storage</li> <li>• Showcase 'Creek Ridge Infiltration System'; infiltration via drainage utilizing the potential of sandy creek ridges for water storage</li> <li>• Showcase 'Drains2Buffer'; optimizing the freshwater volume in shallow rainwater lenses</li> </ul> <p><b>Positions held:</b> Project Leader  <b>Activities performed:</b> Responsible for management activities (coordination, reporting), responsible for progress of project, time management, combining activities within working packages</p>
<p><b>Name of assignment or project:</b> Salt Water Ingress at Marina Bay  <b>Year:</b> 2011  <b>Location:</b> Singapore  <b>Main project features:</b> Rapid assessment causes and effects Salinised Marina Bay  <b>Activities performed:</b> Expert Advice</p>
<p><b>Name of assignment or project:</b> EC-Interreg IV-B Scaldwin: Transboundary variable-density groundwater flow and coupled solute transport modelling of the Flanders region (Belgium-The Netherlands)  <b>Year:</b> 2011-2012  <b>Client:</b> Vlaamse Milieu Maatschappij, Belgium &amp; Province of Zeeland, The Netherlands  <b>Activities performed:</b> Project leader Dutch section</p>
<p><b>Name of assignment or project:</b> PhD project on salinisation phenomena on regional and local scales  <b>Year:</b> 2008-2013  <b>Location:</b> Utrecht, Princetonlaan 6, The Netherlands  <b>Client:</b> Deltares  <b>Main project features:</b> Supervising research on shallow freshwater lenses and salty boils in coupled groundwater-surface water systems  <b>Positions held:</b> Supervision PhD  <b>Activities performed:</b> Responsible for PhD track: peer-reviewed article and time management</p>
<p><b>Name of assignment or project:</b> Netherlands Hydrological Modelling Instrumentarium for Fresh-Salt Groundwater in the Coastal Zone  <b>Year:</b> 2007-2009  <b>Location:</b> Utrecht, Princetonlaan 6, The Netherlands  <b>Client:</b> De Waterdienst, Ministry of Transport, Public Works and Water Management  <b>Main project features:</b> Development of a 3D model of Fresh-Salt Groundwater in the Coastal Zone, assessing the effect of climate change on fresh groundwater resources, change in salt load to surface water systems  <b>Positions held:</b> Project Leader Fresh-Saline Groundwater model  <b>Activities performed:</b> Manager of project, advice, time manager, expert advice on creation of the model</p>
<p><b>Name of assignment or project:</b> EC-Interreg IV-B project Cliwat: on the effects of climate change on water quantity and quality (<a href="http://www.CliWat.eu">www.CliWat.eu</a>).  <b>Year:</b> 2008-2011  <b>Location:</b> Utrecht, Princetonlaan 6, The Netherlands  <b>Client:</b> European commission  <b>Main project features:</b> Supervising modelling activities for assessing the effects of climate change on ground- and surface water; combing Airborne EM data of fresh-saline groundwater into numerical models  <b>Positions held:</b> Senior advisor on a variety of salt water intrusion topics  <b>Activities performed:</b> Input to expert meetings, expert on salt water intrusion issues, training groundwater flow modelling practise</p>

<p><b>Name of assignment or project:</b> On evaluating Salinity Ingress Prevention Measures undertaken in the coastal area of Gujarat, India</p> <p><b>Year:</b> 2009</p> <p><b>Location:</b> Kodinar, Gujarat, India</p> <p><b>Client:</b> Netherlands Water Partnership</p> <p><b>Main project features:</b> assessing effectiveness of compensating measures to salinization of the groundwater system</p> <p><b>Positions held:</b> Hydrogeological expert, numerical modeller</p> <p><b>Activities performed:</b> Determination of salinity concepts, numerical modelling density dependent groundwater flow</p>
<p><b>Name of assignment or project:</b> Future salinisation of the groundwater resources of the Province of Zuid-Holland, under the pressure of sea level rise, climate change and land subsidence</p> <p><b>Year:</b> 2004-2009</p> <p><b>Client:</b> Province of Zuid-Holland, The Netherlands</p> <p><b>Main project features:</b> assessing report, modelling tools, mapping fresh groundwater reserves in the Province of South-Holland, The Netherlands</p> <p><b>Positions held:</b> Modelling variable density expert, project leader (2008-2010)</p>
<p><b>Name of assignment or project:</b> Salinisation of phreatic groundwater in the Province of Zeeland: a study on strategic water resources management in a changing environment. The focus is on water system analysis of groundwater and surface water resources at the Dutch coastal zone, for both quantity as well as quality issues</p> <p><b>Year:</b> 2005-2016</p> <p><b>Location:</b> Utrecht, Princetonlaan 6, The Netherlands</p> <p><b>Client:</b> Province of Zeeland</p> <p><b>Main project features:</b> extensive monitoring campaign, 3D modelling tools for a 3D regional variable-density groundwater flow system</p> <p><b>Positions held:</b> Project leader</p> <p><b>Activities performed:</b> Overall manager of project, advice, time manager, expert advice on monitoring campaign and the creation of the 3D model</p>
<p><b>Name of assignment or project:</b> Study on the fresh-saline groundwater system in the Province of Flevoland, The Netherlands</p> <p><b>Year:</b> 2007</p> <p><b>Location:</b> Utrecht, Princetonlaan 6, The Netherlands</p> <p><b>Client:</b> Province of Flevoland, The Netherlands</p> <p><b>Main project features:</b> water system analyses of fresh-saline groundwater system analysis in the coastal zone, assessing the volume of fresh water available for different types of groundwater extractions</p> <p><b>Positions held:</b> Project leader</p> <p><b>Activities performed:</b> Overall manager of project, advice, time manager, expert advice on monitoring campaign and data collection</p>
<p><b>Name of assignment or project:</b> EC-project: Crystallisation Technologies for Prevention of Salt Water Intrusion.</p> <p><b>Year:</b> 2002-2004</p> <p><b>Location:</b> Free University Amsterdam,</p> <p><b>Client:</b> European commission</p> <p><b>Main project features:</b> The objective of the project is to develop and test a new cost efficient and environmental-friendly technology to reduce and prevent salt water intrusion into fresh groundwater aquifers.</p> <p><b>Positions held:</b> Work package leader</p> <p><b>Activities performed:</b> water system analyses, conceptualization of salinity processes, development of a 3D numerical model describing groundwater flow and grouting processes at an Italian test site (near Bari)</p>

## 12. Certification:

I, the undersigned, certify that to the best of my knowledge and belief, this CV correctly describes myself, my qualifications, and my experience. I understand that any wilful misstatement described herein may lead to my disqualification or dismissal, if engaged.



Date: 13/06/2019

[Signature of staff member or authorized representative of the staff]

Day/Month/Year

Full name of authorized representative: Gualbertus H.P. Oude Essink

### Key qualifications

- Management of groundwater resources
- System analysis variable-density groundwater flow and salt transport
- Mapping fresh groundwater reserves using modeling and monitoring techniques
- Modeling salt water intrusion in coastal aquifers
- Assessing the impacts of climate and global change on groundwater resources
- Monitoring fresh-brackish-saline groundwater
- Understanding the interaction groundwater – surface water in the coastal zone
- Teaching and training

### Key publications

1. 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> download
2. 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>. download
3. 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 download
4. 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 download
5. 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 download
6. 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> download
7. Delsman, J., Van Baaren, E.S., Siemon, B., Dabekaussen, W., Karaolis, 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 download
8. 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> download
9. 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>
10. 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>.

11. 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.
12. 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
13. 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.
14. 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., Fresh Water Lens Persistence and Root Zone Salinization Hazard Under Temperate Climate, *Water Resources Management*, doi: 10.1007/s11269-016-1315-9
15. 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
16. 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* . doi: 10.1111/gwat.12382
17. Pauw, P.S., Van Baaren, E.S., Visser, M., Louw, P.G.B., de, 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
18. Louw, P.G.B., de, 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.
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