



## CURRICULUM VITAE

<b>Name</b>	G.A.P.H. van den Eertwegh, PhD
<b>Date of birth</b>	April 1, 1966
<b>Nationaliteit</b>	Dutch (NL)
<b>Knowledge</b>	Hydrology, water management, irrigation and drainage, evapotranspiration, drainage water quality and surface water quality
<b>Discipline</b>	Team leader, project manager, consultant, researcher
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### Key Qualifications

Gé van den Eertwegh is senior hydrologist with over 20 years of working experience. His expertise is on integrated water management, vadose zone hydrology and transport, and drainage water quality (PhD thesis). He is a specialist in water and solute balances modeling, aiming at supporting strategic and operational decision making in water management. Additionally, his professional profile includes team leader and project manager capacities. He combines people management with content and business aspects. He has built up his expertise in the Netherlands, including his PhD work, at Wageningen University and the Ministry of Public Works/Rijkswaterstaat, at the National Institute of Public Health and Environment, at water boards of Rijnland and Rivierenland, at KWR Watercycle Research Institute, and FutureWater. He has worked abroad on a project basis in e.g. China, Malaysia, USA, India, Pakistan, Romania, and Vietnam, and was actively involved in the ICID International Commission on Irrigation and Drainage, Working Group on Environment. In the Netherlands, he acted as chairman of several nationwide professional working groups, like the STOWA advisory board and TNO Geo-modelling. He is board member of the Dutch Hydrological Society. In Autumn 2013, he started the research and consulting company KnowH<sub>2</sub>O.

### Educational background

2002	PhD at Wageningen Agricultural University, The Netherlands. Subject: Water and Nutrient balances - travel times of drainage water and nutrient loads to surface water. Drainage water quality (salt and nutrients). Field test sites, monitoring, computer modeling.
1990	MSc at Wageningen Agricultural University, The Netherlands. Subjects: groundwater- and surface water hydrology, rainfall runoff modelling, drainage and surface water quality.
1984	Gymnasium $\beta$ at Marianum College, Venlo, The Netherlands.

Courses on team management and project management.



## Professional Experience

- At present      Owner at KnowH<sub>2</sub>O | Consulting, Innovation and Connection in Water,  
The Netherlands
- 2012 - 2013      FutureWater, The Netherlands.  
Manager/senior hydrologist.  
FutureWater is a research company concerned with the future of our water resources. FutureWater applies and, if required, develops scientific methodologies, concepts and tools to assure sustainable water resources solutions for the future. Activities can be summarized as water for food and water for nature under changing environments, including climate change. Simulation models, GIS and remote sensing are the tools used to assist in these activities. Projects take place in the developed as well as the developing world. Emphasis on a pro-active approach with strategic thinking and tools.
- 2010 – 2012      KWR Watercycle Research Institute, The Netherlands.  
Team leader Ecology and Project Manager.  
Water cycle research based on water system management, with respect to sustainability and the natural environment. Ecohydrological studies of field sites, development of expert systems based on location characteristics, and process based modeling of ecohydrology under a changing climate.
- 2005 – 2010      Water authority Rivierenland, The Netherlands.  
Team leader.  
Ground and surface water hydrology, surface water chemistry and aquatic ecology. Simulation models and site studies. Water systems analysis. Database management.
- 1997 – 2005      Water authority Rijnland, The Netherlands.  
Project manager and team leader.  
Surface water hydrology, surface water chemistry and aquatic ecology. Simulation models and integrated site studies. Water systems analysis. Integrated projects with provinces and local communities. Project manager of two regional scale research projects in the Dutch polder area on agriculture, water management and water chemistry: peat soils and reclaimed lake.
- 1992 – 1997      Wageningen Agricultural University, Dept. Water Resources, The Netherlands.  
National Institute for Public Health and the Environment, The Netherlands.  
PhD-student.  
Subject: Water and Nutrient balances - travel times of drainage water and nutrient loads to surface water.



1990 – 1992      Wageningen Agricultural University, Dept. Water Resources, The Netherlands.  
Associate researcher.  
Short-term water level and discharge forecasts for the Rhine River (t+4 days).  
Development and update of statistical model.

## Overseas Professional Experience

### *Non-resident assignments:*

China, Malaysia, USA, Pakistan, India, Vietnam, Romania.

### *Projects:*

- Modernization of irrigation systems in northern Nile basin Egypt. World Bank (2011-2012).
- Green Water Management and Credits in China: case study Wuhan, Yangtze River basin. Partners for Water (2012-2013). Hydrological and erosion modeling using remote sensing information and field data of a 9,000 km<sup>2</sup> basin. Cost-benefit analysis of measures to reduce erosion and to increase water supply.
- Towards a Mekong Delta Portal, Vietnam. Partners for Water (2012-2013). Drought monitoring and water demand-supply modeling using remote sensing information and ground-based data.
- OPI Romania (2013-2015): development and design of an online irrigation strategy, based on integrated field data, remote sensing information, and farm-scale modeling results.
- Urban Planning System and Green Water Management and Credits (GWMC) concept in Haidong City, China (2014). Bringing the GWMC concept into the urban area.
- Water and Agriculture in Vietnam (2016): climate smart solutions. A mission towards an integrated approach of soil, water, and crop management at the farm and regional scale.
- Remote sensing and aquatic vegetation (2016): development and testing of mapping aquatic vegetation by hyperspectral sensing, using UAV and Korean test site (KICT) for calibration and validation purposes.
- Small Island Developing States and Climate Change: ToR for implementation of an information portal on climate change, mitigation, and adaptation activities.

## Consulting Experiences

*Only consultancies started, on-going or completed after 2003 are included.*

2003-2005	Rijnland water authority: hydrology; water quality; water management
2005-2010	Rivierenland water authority: hydrology; water quality; water management International Commission on Irrigation and Drainage (ICID) EU-WFD, chairman monitoring Rhine-West region
2010-2012	KWR Watercycle Research Institute Surface water mass balance uncertainty Agricultural crop damage due to hydrologic impact of groundwater extraction and surface water management  Involvement in National Hydrological modelling Instrument (NHI)



2012-2013 FutureWater

Climate Adaptive Drainage system - Development, design, and field test  
 Groundwater for Crops - Optimal use of soil and groundwater for crop production  
 Groundwater recharge at Veluwe natural area  
 DAISY – Development of mobile radar systems and rainfall runoff modelling  
 Egypt – Modernization of irrigation systems and management  
 Vietnam – Towards a Mekong Delta portal  
 China – Green Water Management and Credits toolkit  
 Romania – Online field irrigation system (Partnerd-for-Water, OPI Romania project)

2013 to present

KnowH2O

Water System Analysis for water, nitrogen, and phosphorus; mass balances and load calculations (EU – WFD)  
 Urban Planning Haidong City, China, and Green Water Management and Credits  
 TKI Groundwater for Crops: field test of automated drainage and irrigation system  
 DAISY – Development of mobile radar systems and rainfall runoff modelling  
 SWIMM – Soil Water evaluation based on Integrated Measurements and Modelling: online instrument to evaluate nature policy by Province of North-Brabant  
 Physical plausibility of actual evapotranspiration data based on remote sensing  
 Water level management related to water quality aspects  
 Climate Adaptive Drainage and sub-irrigation using treated fresh water from domestic waste water treatment plant: aspects of water quality in soil and groundwater  
 SAWAX – smart weir for water management: design and field test  
 Domestic waste water treatment and water quality: policy analysis and project plan  
 Vietnam – ToR Remote Sensing and Water Management of Red River  
 Poland – Mission on irrigation, drainage, and agriculture  
 Integrated water system analysis for water management and focused improvement measures  
 Vietnam – Mission on Water, Soil, Crop, and Agriculture in Bac Lieu (Mekong Delta), Binh Thuan, and Ninh Thuan province  
 Sub-irrigation using groundwater: efficient and effective water use during meteorological drought.  
 Small Island Developing States and Climate Change: ToR for implementation of an information portal on climate change, mitigation, and adaptation activities.

### Working Groups

NHV Board member of Dutch Hydrological Society (2009-present)  
 Chairman of Working Group on Evapotranspiration (2010-present)  
 ICID Secretary of Working Group on Environment (2005-2010)  
 STOWA Water system analysis, chairman of advisory panel of water boards (2005-2010)  
 TNO Chairman of User Committee on Subsurface Soil Modeling (2008-2012)



<b>Languages</b>	<b>Speak</b>	<b>Read</b>	<b>Write</b>
Dutch	<i>mother language</i>		
English	<i>excellent</i>	<i>excellent</i>	<i>excellent</i>
German	<i>good</i>	<i>good</i>	<i>good</i>

## **Publications**

### *In dutch*

Eertwegh, G.A.P.H. van den (1992):

Voorspellingen waterstand en afvoer Rijn. Ministry of Public Works and Water Management, RIZA, Leystad, the Netherlands. RIZA Report No. 92.006.

Eertwegh, G.A.P.H. van den en A.L. Mugie (1994):

Korte termijn voorspellingen waterstand en afvoer Bovenrijn te Lobith. H<sub>2</sub>O (27) 1994, No. 5.

Meinardi, C.R. and G.A.P.H. van den Eertwegh (1995):

Onderzoek aan drainwater in de kleigebieden van Nederland. Deel I: Resultaten van het veldonderzoek. RIVM Rapport No. 714901007.

Brongers, I. and K.P. Groen and G.A.P.H. van den Eertwegh and C.R. Meinardi (1996):

Emissie van bestrijdingsmiddelen en nutriënten naar het oppervlaktewater via drainage. Ministry of Transport, Public Works and Water Management, Flevovericht No. 384.

Meinardi, C.R. and G.A.P.H. van den Eertwegh (1997):

Onderzoek aan drainwater in de kleigebieden van Nederland. Deel II: Gegevens van het oriënterend onderzoek. RIVM Rapport No. 714801013.

Meinardi, C.R., G.A.P.H. van den Eertwegh, and C.G.J. Schotten (1998):

Grondwateraanvulling en oppervlakkige afstroming in Nederland. Deel 2: De ontwatering van kleigronden. In: Stromingen 4 pp. 5-19 (1998).

Eertwegh, G.A.P.H. van den and C.R. Meinardi (1999):

Water- en nutriëntenhuishouding van het stroomgebied van de Hupselse Beek. RIVM, National Institute of Public Health and the Environment, rapport no. 714901005. Wageningen Agricultural University, Dept. of Water Resources. Rapport 74.

Eertwegh, G.A.P.H. van den, J.R. Hoekstra, and C.R. Meinardi (1999):

Praktijkproef Nutriëntenbalans: Nutriëntenbelasting oppervlaktewater via drainage van akkerbouwpercelen op zavel. Wageningen Agricultural University, Dept. of Water Resources. Rapport 75.

Eertwegh, G.A.P.H. van den, J.G. Kroes, A. Smit en F.H. van Schaik (2003):

Peilbeheer met FIW MultiSWAP. H<sub>2</sub>O 20 (2003), pp. 28-31.





- Eertwegh, G.A.P.H. van den, en C.L. van Beek (2004):  
Veen, water en vee. Water- en nutriëntenhuishouding van een veenweidepolder. Eindrapport van het Veenweideproject fase I, uitgevoerd in de Vlietpolder. Hoogheemraadschap van Rijnland. STOWA-Rapport 2004-30, ISBN 90.5773.270.x.
- Hardeveld, H.A. van, G.A.P.H. van den Eertwegh en C.L. van Beek (2006):  
Verbetering waterkwaliteit in veenweidepolders haalbaar. H<sub>2</sub>O No. 12 (2006).
- Vries, P. de, G.A.P.H. van den Eertwegh en L. Nooteboom (2006):  
Modern waterbeheer is transparant en doelgericht: Hoogheemraadschap van Rijnland van taakgericht naar doelgericht. H<sub>2</sub>O No. 8 (2006).
- Eertwegh, G.A.P.H. van den en M.I. Mul (2007):  
Evaluatie Meststoffenwet voor een betere kwaliteit van het oppervlaktewater? Twee opinie-artikelen in H<sub>2</sub>O (2007).
- Eertwegh, Gé van den, Joost Heijkers, Durk Klopstra en Michelle Talsma (2009):  
Onzekere hydrologische modelresultaten: bedreigend of gewenste informatie? H<sub>2</sub>O / 3-2009.
- Schuurmans, H., H. Niewold, G. van den Eertwegh en P. Droogers (2010):  
NBW-actueel: ontwikkeling methode voor wateropgaven met een bandbreedte. H<sub>2</sub>O Tijdschrift voor watervoorziening en waterbeheer 2010-1: 25-29.
- Terink, W., P. Droogers, W.W. Immerzeel, G.A.P.H. van den Eertwegh (2012):  
SPHY – Een hydrologisch model gericht op de berekening van bodemvocht en de actuele verdamping. FutureWater rapport 115.
- Terink, W., G.A.P.H. van den Eertwegh, P. Droogers (2012):  
Model voor landsdekkende berekening bodemvocht in wortelzone en actuele verdamping. H<sub>2</sub>O/23-2012: 16-18.
- Eertwegh, G.A.P.H. van den, L.Kuipers, W. Klerk, J. van Bakel, L. Stuyt, A. van Iersel, M.Talsma (2012):  
Klimaatadaptieve drainage: middel tegen piekafvoeren en watertekorten. H<sub>2</sub>O/18-2012: 8-10.
- Terink, Wilco, Jan van Bakel, Eertwegh, Gé van den, en Peter Droogers (2013):  
KlimaatAdaptieve Drainage: Modelberekeningen met SWAP ter bepaling van effecten KAD op reductie van piekafvoeren en op waterconservering. FutureWater rapport nr. 117.
- Bakel, Jan van, Gé van den Eertwegh, Harry Massop en Jäirus Brandsma (2013):  
KlimaatAdaptieve Drainage: Landelijke geschiktheid van conventionele, samengestelde peilgestuurde en klimaatadaptieve drainage. FutureWater rapport nr. 118.
- Eertwegh, Gé van den, m.m.v. Ada Karimlou-Kranendonk (2013):  
KlimaatAdaptieve Drainage: Juridisch-bestuurlijke aspecten. FutureWater rapport nr. 119.
- Eertwegh, Gé van den, en Peter Droogers (2013):  
KlimaatAdaptieve Drainage: Analyse van kosten en baten voor waterbeheerder en agrariër.



FutureWater rapport nr. 120.

Eertwegh, Gé van den, Leo Kuipers, Wim Klerk, Jan van Bakel, Lodewijk Stuyt, Ad van Iersel en Michelle Talsma (2013):

KlimaatAdaptieve Drainage: een innovatieve methode om piekafvoeren en watertekorten te verminderen. Eindrapportage Fase 2 'Onderzoek en Ontwikkeling'. Referentienummer SBIR113008. FutureWater rapport nr. 121.

Eertwegh, G.A.P.H. van den, P.J.T. van Bakel, L. Stuyt, A. van Iersel, L. Kuipers, M. Talsma, P. Droogers (2013):

Klimaatadaptieve Drainage: een innovatieve methode om piekafvoeren en watertekorten te verminderen. Opgesteld door FutureWater, Kuipers Electronic Engineering, De Bakelse Stroom, Van Iersel, Wageningen UR/Alterra en STOWA. Samenvatting resultaten Fase 2 'Onderzoek en Ontwikkeling' SBIR-KAD. FutureWater rapport 123.

Eertwegh, G.A.P.H. van den, P.J.T. van Bakel, L. Stuyt, A. van Iersel, L. Kuipers, W. Klerk, M. Talsma (2013):  
Waterregie in droge en natte tijden. H2O-5, 2013.

Krikken, A., R. Hulsman, I. Folmer en G.A.P.H. van den Eertwegh (2014).

Herkomst van water en nutriënten in KRW-oppervlaktewaterlichamen in het beheergebied van Waterschap Aa en Maas. RHDHV en KnowH<sub>2</sub>O, ref. nr. BC7872/R0001/902344/Nijm.

Floris Verhagen, Teun Spek, Flip Witte, Bernard Voortman, Eddy Moors, Erik Querner, Gé van den Eertwegh en Jan van Bakel (2014).

Expertdialoog de Veluwe. Begrijpen we het watersysteem? Stromingen 20 (2014) nr. 3, pp 5-19.

Eertwegh, G.A.P.H. van den (2015):

Peilbeheer en chemische waterkwaliteit: beheergebied Aa en Maas. Rapport KnowH<sub>2</sub>O (2015).

Terink, W., P. Droogers en G.A.P.H. van den Eertwegh (2015):

De toegevoegde waarde van hoge-resolutie neerslagradar voor het waterbeheer. Case-study binnen het "Daring Applications & Innovations in Sensor Systems" (DAISY) project. Report FutureWater 135, 2015.

NHV-Werkgroep Verdamping (2015):

Verdamping in de hydrologie. NHV-Special 8, 2015. ISBN 978-90-803565-0-4.

#### *International – English and German*

Luft, G., G.A.P.H. van den Eertwegh, and H.-J. Vieser (1990):

Veränderung der Bodensee-Wasserstände von 1887 bis 1987 (in Duits). LfU Baden-Württemberg, Karlsruhe. Handbuch Hydrologie Baden-Württemberg, Teil 6, 6.2 Berichte, 1990.

Luft, G. and G.A.P.H. van den Eertwegh (1990):

Long-term changes in water level of Lake Constance and possible causes. Annex to Proceedings and Information No. 44, pp. 21-40 (1990). CHO TNO Committee on Hydrological Research, the Netherlands.



- Luft, G. and G.A.P.H. van den Eertwegh (1991):  
Long-term changes in the water level of Lake Constance and possible causes. IAHS Symposium Hydrology of Natural and Man-made Lakes, Vienna, 1991. IAHS Publication No. 206, 1991.
- Eertwegh, G.A.P.H. van den and P.M.M. Warmerdam (1993):  
Storm runoff and nutrient transport from a drained plot in the Hupsel catchment. Second International Conference on Friends, Braunschweig, 1993. Editor: A. Herrmann, TU Braunschweig, Germany.
- Eertwegh, G.A.P.H. van den (1994):  
Transport of nutrients to small surface waters through drainage. IAHR Symposium Transport and Reactive Processes in Aquifers, Switzerland, 1994. Proceedings, pp. 255-261.
- Nieber, J.L., G.A.P.H. van den Eertwegh, and R.A. Feddes (1998):  
Modeling multidimensional water flow and solute transport in dual-porosity soils. ASAE 7<sup>th</sup> Drainage Symposium Proceedings 'Drainage in the 21<sup>st</sup> Century: Food Production and the Environment', Florida, 1998.
- Louw, P.G.B. de, G.A.P.H. van den Eertwegh, and J. Griffioen (2000):  
High nutrient and chloride loads to surface waters in polder areas due to groundwater seepage. Proceedings of the 30<sup>th</sup> AH Congress on Groundwater: Past achievements and future challenges. Cape Town, South Africa, 2000. A.A. Balkema Publishers, Rotterdam-Brookfield.
- Eertwegh, G.A.P.H. van den, J.L. Nieber, and R.A. Feddes (2001):  
Multidimensional flow and transport in a drained, dual-porosity soil. ASAE 2<sup>nd</sup> International Symposium and Exhibition on Preferential Flow, Hawaiï, 2001.
- Louw, P.G.B. de, J. Griffioen, G.A.P.H. van den Eertwegh, and B. Calf (2002):  
High nutrient and chloride loads in polder areas due to groundwater exfiltration. 2<sup>nd</sup> International Conference on New Trends in Water and Environmental Engineering for Safety and Life: Eco-compatible Solutions for Aquatic Environments, Capri, Italy, June 24-28, 2002.
- Eertwegh, G.A.P.H. van den (2002):  
Water and nutrient budgets at field and regional scale. Travel times of drainage water and nutrient loads to surface water. Proefschrift, Wageningen Universiteit.
- Beek, C.L. van, G.A.P.H. van den Eertwegh, F.H. van Schaik, and A. van den Toorn (2003):  
Surface runoff from intensively managed grassland on peat soils; a diffuse source of nitrogen and phosphorus in surface waters. Congress paper 'Diffuse input of chemicals into soils & groundwater: Assessment & Management'. February 26-28, 2003, Dresden, Germany.
- Beek, C.L. van, G.A.P.H. van den Eertwegh, F.H. van Schaik, G.L. Velthof, and O. Oenema O. (2004):  
The contribution of dairy farming on peat soil on N and P loading of surface water. Nutrient Cycling in Agroecosystems 70: pp. 85-95.
- Groenendijk, P. and G.A.P.H. van den Eertwegh (2004):  
Travel times of groundwater exfiltration to surface water. Unsaturated zone modeling: progress, challenges, and applications. Wageningen University, October 2004.
- Eertwegh, G.A.P.H. van den, J.L. Nieber, P.G.B. de Louw, H.A. van Hardeveld, and R. Bakkum (2005):





- Impacts of drainage activities for clay soils on hydrology and surface water quality. ICID tri-annual congress, Beijing, September 2005.
- Eertwegh, G.A.P.H. van den, J.L. Nieber, P.G.B. de Louw, H.A. van Hardeveld, and R. Bakkum (2006): Impacts of drainage activities for clay soils on hydrology and solute loads to surface water. *Irrigation and Drainage* 55, 235-245 (2006).
- Beek, C.L. van, P. Droogers, H.A. van Hardeveld, G.A.P.H. van den Eertwegh, G.L. Velthof, and O. Oenema (2007): Leaching of solutes from an intensively managed peat soil to surface water. *Water, Air, and Soil Pollution* (2007) 182: 291–301.
- Simons, G., W. Terink, H. Badawy, G.A.P.H. van den Eertwegh, W.G.M. Bastiaanssen (2012): Egypt: Assessing the Effects of Farm-Level Irrigation Modernization on Water Availability and Crop Yields. Final Report (Summer 2011 and Winter 2011/2012). World Bank research project.
- Brandsma, J., G.A.P.H. van den Eertwegh, P. Droogers, Z. Bai, and S. Zhang (2013): Green and Blue Water Resources and Management Scenarios using the SWAT model for the Upper Duhe Basin, China - Feasibility Study. *Green Water Management & Credits Toolbox China*. November 2013. Commissioned by Partners for Water, project PVWS12001. Report FutureWater 126.
- Droogers, P., J. Brandsma, Z. Bai, G.A.P.H. van den Eertwegh, and G.W.J. van Lynden (2013): Benefit-Cost Analysis Based on Supply-Demand Modeling by WEAP for the Upper Duhe Basin, China – Feasibility Study. *Green Water Management & Credits Toolbox China*. November 2013. Commissioned by Partners for Water, project PVWS12001. Report FutureWater 129.
- Eertwegh, G.A.P.H. van den, R. Bartholomeus, and G. Cirkel (2015): Reuse of treated domestic wastewater by sub-irrigation of agricultural land: modeling water and solute transport using SWAP (1D) and HYDRUS (2D). *HYDRUS short course and workshop on Advanced modeling of water flow and contaminant transport in porous media using the HYDRUS and HP1 software packages*. Book of Abstracts, March 24 – 26, 2015, Prague, Czech Republic.
- Bartholomeus, R.P., G.A.P.H. van den Eertwegh, and G. Simons (2015): Anticipating on amplifying water stress: Optimal crop production supported by anticipatory water management. *Geophysical Research Abstracts*, Vol. 17, EGU2015-5354, 2015, EGU General Assembly 2015.