

CURRICULUM VITAE

Prof. Dr. habil. MARIO SCHIRMER



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Eawag - Swiss Federal Institute of Aquatic Science
and Technology
Department Water Resources and Drinking Water (W+T)
Research Group Hydrogeology
Überlandstr. 133
CH-8600 Dübendorf
Switzerland

Residence:
Guggenbühlstrasse 15
CH-8304 Wallisellen
Switzerland

Phone: +41 58 765 5382

Citizenship: Swiss, Canadian

Date of Birth: July 24, 1964

Languages: German (fluent), English (fluent), French (B2), Russian (basic)

Education:

Habilitation	Applied Geology, University of Tübingen, Germany, 2002
Ph.D.	Earth Sciences, University of Waterloo, Canada, 1999
German Diplom (M.Sc.)	Geophysics, Technische Universität Bergakademie Freiberg (Technical University Mining Academy Freiberg), Germany, 1991

Research and Work Experience:

Senior Scientist, Head of Research Group Hydrogeology since March 2008
Eawag - Swiss Federal Institute of Aquatic Science and Technology, Department Water
Resources and Drinking Water (W+T), Switzerland

Associate Professor since August 2008
University of Neuchâtel, Faculty of Sciences, Centre for Hydrogeology, Switzerland

Univ.-Prof. for Hydrogeology and Modelling, December 2004 – February 2008
Martin-Luther-University Halle-Wittenberg, Institute for Geological Sciences, Germany

Head of Department of Hydrogeology, July 2002 – February 2008
Helmholtz Centre for Environmental Research - UFZ, Leipzig and Halle / Saale,
Department of Hydrogeology, Germany

July 2004 Offer for a position of „Associate Professorship“ (Canada Research Chair,
Tier II) in Water Resources at the University of Calgary (Alberta, Canada)
(Offer not accepted)

November 20, 2002 Habilitation at the University of Tübingen, Germany

- Interim Head of Department of Hydrogeology, January 2002 – June 2002
UFZ Centre for Environmental Research Leipzig-Halle, Halle / Saale, Department of Hydrogeology, Germany
- October 2001 Offer for a position of „Associate Professorship“ in Hydrogeology at the University of Copenhagen (Denmark) (Offer not accepted)
- Postdoctoral Research Associate, July 1999 – December 2001
UFZ Centre for Environmental Research Leipzig-Halle, Leipzig, Dept. Industrial and Mining Landscapes, Germany
- Scientist, December 1998 – June 1999
University of Waterloo, Department of Earth Sciences, Canada
- Ph.D. candidate, September 1993 – November 1998 (convocation June 1999)
University of Waterloo, Department of Earth Sciences, Canada
Thesis: Investigation of multiscale biodegradation processes: A modelling approach
- Scientist, March 1991 - June 1993
Institute for Hydraulic Engineering, University of Stuttgart, Germany
- German Diplom (M.Sc.), September 1986 - February 1991
University Mining Academy Freiberg, Institute for Applied Geophysics, Germany
Thesis: Delineation of landfills and old, abandoned waste dumps using self potential and induced polarisation techniques
- Student Geophysicist, Geoelectrics, April - June 1990
Waterworks Colbitz, Germany
Responsibilities: - geoelectrical measurements
- conducting and evaluating a groundwater tracer test
- Student Geophysicist, Gravimetry, July - August 1989
Gravity Division, VEB Geophysik, Leipzig, Germany
Responsibilities: - gravimetrical measurements
- land surveying
- investigation of the spatial extent of a sodium chloride deposit
- Student Geophysicist, Magnetism, July - August 1988
Magnetism Division, VEB Geophysik, Leipzig, Germany
Responsibilities: - geomagnetical measurements
- investigation of a regional scale magnetic anomaly
- Student Geophysicist, Seismics, July - August 1987
Seismics Division, VEB Geophysik, Leipzig, Germany
Responsibilities: - preparation of seismic measurements
- evaluation of seismic data

Teaching Experience:

Lecture at the University of Neuchâtel "Urban Hydrogeology" (since Fall Semester 2016)

Course at the ETH Zurich "Transdisciplinary Case Study - River Management of the Thur Catchment", Lectures on societal and ecological issues of river restoration as well as groundwater – surface water interactions (Spring Semester 2012)

Lecture at the ETH Zurich "Water Resources and Drinking Water", Lectures on groundwater and contaminants (since Fall Semester 2009)

Lecture at the University of Neuchâtel "Characterization of Contaminated Sites" (since Spring Semester 2009)

Lecture and Practical Training at the University of Neuchâtel "Field school - Hydrogeological Investigation Techniques" (since 2009)

Lecture at the Martin-Luther-University Halle-Wittenberg "Representative Groundwater Sampling Technologies" (2005 - 2008)

Lecture at the Martin-Luther-University Halle-Wittenberg "Hydrogeological Modelling: Part Transport Modelling" (2005 - 2008)

Lecturer at the University of Tübingen within the M.Sc. Program "Applied Environmental Geoscience", Course "Hydrogeological Investigation Techniques" (2002 - 2010).

Co-ordinator and instructor, University of Waterloo, Dept. of Earth Sciences

Graduate Level: Field Methods in Hydrogeology

Lectures on: Hydraulic aquifer parameter evaluation (pumping tests / slug tests)
Groundwater monitoring and sampling equipment

Teaching Assistant, University of Waterloo, Dept. of Earth Sciences (beside marking of papers, preparing assignments and tutoring; additional tasks are listed below)

Undergraduate Level: Global Geophysics

tasks: - preparation of MATHLAB programs
- tutorials on MATHLAB

Field Methods in Geophysics

tasks: - field application on gravity / VLF measurements
- conducting seismic and geoelec. measurements

Numerical Methods in Geology

tasks: - writing of FORTRAN codes for assignments
- running computer tutorials and labs

Graduate Level:

Flow and Transport Through Porous Media

tasks: - computer labs in physical hydrogeology
- tutorials on aquifer hydraulic analyses

Advanced Numerical Methods in Geology

tasks: - writing of FORTRAN codes for assignments
- supervision of students' modelling projects

Advanced Groundwater Modelling

tasks: - writing of FORTRAN codes for assignments

- supervision of students programming projects
- Field Methods in Hydrogeology
 - tasks: - conducting pumping and slug tests
 - surveying
 - groundwater sampling
 - geophysical measurements
- Groundwater Resources Development
 - tasks: - preparing and conducting tutorials on lab methods
 - computer lab tutorials on aquifer test analyses

Teaching Assistant, University Mining Academy Freiberg, Institute for Applied Geophysics
Undergraduate Level: Theoretical Geophysics

- tasks: - development of FORTRAN programs
- tutorials on field potentials in geophysics

Major Conferences Organized as Conference Chair:

Wasser und Landwirtschaft – Wechselwirkungen und Zielkonflikte / Eau et agriculture :
Interactions et conflits d'intérêts, May 28, 2021, Online (about 200 participants).

River Corridor Restoration Conference 2011 (RCRC11): Towards a mechanistic understanding
of coupled hydrological and ecological processes in near-river corridors, March 13–18,
2011, Centro Stefano Franscini, Monte Verità, Ascona, Switzerland (about 75 participants).

Groundwater Quality Conference 2010 (GQ10): Groundwater quality management in a rapidly
changing world, June 13 - 18, 2010, Zurich, Switzerland (about 220 participants).

Supervised Students, Postdocs and Guest Scientists:

Raoul Collenteur (PhD student, University of Graz, Austria, Co-supervision 2021)
Project: Seasonal outlooks of groundwater levels over Europe using Pastas

Christian Möck (Project coordinator, Eawag, 2020-today)
Project: Swiss Groundwater Network (CH-GNet)

Yong Wang (MSc, IHE Delft Institute for Water Education, Netherlands, Co-supervisor 2020-
2021)
Thesis: Evaluating the potential for sustainable groundwater abstraction from the Limpopo Sand
River deposits in Mozambique

Lisa Hoffmann (MSc, Eawag / Technical University of Dresden, Germany, 2019-2020)
Thesis: A snapshot comparison between surface water and groundwater ¹⁸O and ²H isotope
ratios in the Thur Catchment, Switzerland

Negar Tayebzadeh Moghadam (PhD student, University of Tehran, Iran, Co-supervisor 2019)
Thesis: Spatiotemporal modelling of water balance components in response to climate and land
use changes in a heterogeneous mountainous catchment

Sandra Pool (Postdoc, Eawag, 2018-today)

Project: IRRIWAM: Understanding the effects of irrigation modernization in water resources management – citrus production in the Jucar river basin, Spain

Maria Jimena Henao Salgado (MSc, Eawag / ETH Zurich, 2018-2019)

Thesis: Urban hydrogeology: Investigation of groundwater recharge and sewer / groundwater interaction in the Fehraltorf catchment (Switzerland)

Nicole Burri (PhD student, Eawag / University of Neuchâtel, 2017-today)

Thesis: Water Distribution: Adaptive monitoring and distributed modelling at catchment scale – field methods

Marco Dal Molin (PhD student, Eawag / University of Neuchâtel, 2017-today)

Thesis: Water Distribution: Adaptive monitoring and distributed modelling at catchment scale – modelling approaches

Robin Weatherl (PhD student, Eawag / University of Neuchâtel, 2016-today)

Thesis: Urban hydrogeology: adaptive field sampling and monitoring strategies for the Fehraltorf catchment (Switzerland)

Maximilian Ramgraber (PhD student, Eawag / University of Neuchâtel, 2016-today)

Thesis: Urban hydrogeology: numerical investigations at the Fehraltorf catchment (Switzerland)

Morgane Minnig (MSc Eawag / EPF Lausanne, 2016-2017)

Thesis: Impact of urbanization on groundwater recharge: The case study of Dübendorf, Switzerland

Behnam Doulatyari (Postdoc, Eawag, 2015-2016)

Project: Development and implementation of geodatabase and web GIS platform for precipitation, runoff and discharge for the Thur catchment

Lucien Stolze (MSc Eawag / Danish Technical University, 2014-2015)

Thesis: Spatial variability of arsenic in groundwater of the Poura gold area, Burkina Faso (West Africa)

Andrea Betterle (PhD student, Eawag / University of Neuchâtel, 2015-2019)

Thesis: Stochastic modelling of hydrological processes at the catchment scale

Elham Rouholahnejad (Postdoc, Eawag, 2014)

Project: Modelling impacts of climate change on fresh water availability in Europe

Christian Möck (Postdoc, Eawag, 2014-2019)

Project: Regional water supply Basel-Landschaft 21

Dirk Radny (Postdoc, Eawag, 2013-2017)

Project: Instrumentation, online sensing, data management and semantic annotations within an interdisciplinary river restoration project - Linking the disciplines ecology, biogeochemistry, geophysics and hydrogeology

Anja Bretzler (PhD student, Eawag / University of Neuchâtel, 2014-2018)

Thesis: Influence of river restoration projects on water quality at the catchment scale

Stefano Basso (PhD student, Eawag / University of Neuchâtel, 2012-2016)

Thesis: Influence of river restoration projects on water quality at the catchment scale

Vidhya Chittoor Viswanathan (PhD student, Eawag / University of Neuchâtel, 2011-2015)

Thesis: Influence of river restoration projects on water quality at the catchment scale

Mehdi Ghasemizade (PhD student, Eawag / University of Neuchâtel, 2011-2016)

Thesis: Modelling of water flow and substrate transport at the catchment scale in an pre-alpine region

Behnam Doulatyari (PhD student, Eawag / University of Neuchâtel, 2011-2015)

Thesis: Modelling study of water distribution at the catchment scale to prevent large flood events and to provide sustainable water supply

Alice Badin (PhD student, University of Neuchâtel, Co-supervisor 2011-2015)

Thesis: Natural attenuation evaluation of chlorinated solvents using isotopic fractionation

Anne-Marie Kurth (PhD student, Eawag / University of Neuchâtel, 2011-2014)

Thesis: Investigation of groundwater-surface water interaction by means of distributed temperature sensing (DTS)

Jana von Freyberg (PhD student, Eawag / University of Neuchâtel, 2010-2014)

Thesis: Alpine hydrogeology and climate change

Lena Froyland (MSc student, Eawag / Norwegian Univ. of Science and Techn., 2010-2011)

Thesis: Characterizing the dynamics of groundwater flow in a losing system

Samuel Diem (PhD student, Eawag / University of Neuchâtel, 2010-2013)

Thesis: Reactive transport modelling of column experiments and a natural riverbank filtration system

Christian Möck (PhD student, University of Neuchâtel, Co-supervisor 2010-2013)

Thesis: Groundwater systems under the influence of a changing climate

Nadine Taube (MSc Student, Eawag / Brandenburg University of Technology Cottbus, 2010)

MSc-Thesis: 3-D Groundwater flow modelling of groundwater - surface water interactions at the Swiss river Thur

Philipp Schneider (Postdoc, Eawag, 2008-2010)

Project: Instrumentation, online sensing, data management and semantic annotations within an interdisciplinary river restoration project - Linking data / metadata and the disciplines ecology, biogeochemistry, geophysics and hydrogeology

Tobias Vogt (PhD student / ETH Zurich Eawag, 2008-2011)

Thesis: Quantification of river water – groundwater interaction at a restored river section; PhD awarded at ETH Zurich

Thilo Thum (MSc student, Eawag / University of Tübingen, 2008-2009)

Thesis: Identification and quantification of groundwater exfiltration areas in a side channel of Swiss River Thur (NE Switzerland)

Taleb Odeh (PhD student, Helmholtz Centre for Environmental Research - UFZ / Technical University Mining Academy Freiberg, 2006-2011), Germany
Thesis: Structural control of hydrology, hydrogeology and hydrochemistry along the NW extension of Wadi Sirhan depression (Jordan) using GIS, Remote sensing and field methods; PhD awarded at the Technical University Mining Academy Freiberg

Andreas Musolff (PhD student, Helmholtz Centre for Environmental Research - UFZ / University of Neuchâtel, 2006-2010)
Thesis: Development of investigation and modelling strategies in urban hydrogeology; PhD awarded at the University of Neuchâtel

Sebastian Leschik (PhD student, Helmholtz Centre for Environmental Research - UFZ / University of Neuchâtel, 2006-2010)
Thesis: Regional methods for the investigation of solute transport in urban areas; PhD awarded at the University of Neuchâtel

Edda Kalbus (PhD student, Helmholtz Centre for Environmental Research - UFZ / University of Neuchâtel, 2005-2009)
Thesis: Spotlight on heterogeneity: Measuring and modelling stream – aquifer interactions; PhD awarded at the University of Neuchâtel

Julien Nikiema (PhD student, Helmholtz Centre for Environmental Research - UFZ / University of Leipzig, 2005-2009)
Thesis: Dry dams in crystalline zone and under sahelian climate: Case study of Birimian segment reserves of furrow between Kongoussi and Seguenega (Northern Burkina Faso) ; PhD awarded at the University of Leipzig, Germany

Annika Beckmann (Guest Scientist, BIOPRACT Berlin, 2004-2007)
Project: Model supported feedback controlling for modular in situ gas walls at the Leuna site

Christian Schmidt (PhD student, Helmholtz Centre for Environmental Research - UFZ / University of Neuchâtel, 2004-2009)
Thesis: Water and contaminant fluxes at the stream – groundwater interface; PhD awarded at the University of Neuchâtel

Holger Fabritius (Scientist, Helmholtz Centre for Environmental Research - UFZ, 2004-2006)
Project: Biodegradation modelling of MTBE and other contaminants at the Leuna test site for the implementation of the „Enhanced Natural-Attenuation“ approach

Marion Martienssen (Scientist, Helmholtz Centre for Environmental Research - UFZ, 2004-2008)
Project: Management of METLEN-Project - MTBE and other contaminants at the Leuna test site for the implementation of the „Enhanced Natural-Attenuation“ approach

Lina Ekere (Guest Scientist and PhD student, Lund University, Sweden, 2002-2003)
Thesis: Transport behaviour of bacteria in saturated media

Stefan Gödeke (PhD student, UFZ Leipzig-Halle / University of Tübingen, 2000-2004)
Thesis: Numerical modelling of reactive transport to quantify the natural attenuation potential at the field site Zeitz; PhD awarded at the University of Tübingen, Germany

Peter Knappett (Guest Scientist, University of Waterloo, 2001-2002)

Project: Pathogens in water

Stefanie Knoblauch (MSc student, UFZ Leipzig-Halle, 2000-2001)

Thesis: Assessment of technical, economic and ecological implications for the use of ethanol instead of methyl-tertiary butyl ether (MTBE) as oxygenate and octane booster in gasoline. MSc awarded at the University of Stuttgart

Matthias Effenberger (MSc student, UFZ Leipzig-Halle, 1999-2000)

Thesis: The potential impact of the gasoline additive methyl-tertiary butyl ether (MTBE) on groundwater. MSc awarded at the University of Stuttgart

Graham C. Durrant (MSc student, University of Waterloo, 1997-1999; co-supervisor with Emil O. Frind)

Thesis: Dissolution modelling of a creosote field experiment at Borden, Ontario, Canada

Boards and Expert Work:

- 2019-today WASH Expert in the Swiss Humanitarian Aid Unit (SHA) within the Swiss Agency for Development and Cooperation (SDC)
- 2019-today Delegate for Wallisellen of the Group Water Supply Lattenbuck (Gruppenwasserversorgung Lattenbuck)
- 2018-today Member of the Swiss Hydrological Commission (CHy), Geosciences Platform of the Swiss Academy of Sciences (SCNAT)
- 2017-21 President of the Eawag Staff Representation
- 2010-15 Scientific Advisory Board German Centre for Groundwater Research, Dresden, Germany
- 2010-14 Advisory Board Section Hydrogeology within the German Association of Geosciences

Review Panels (selection):

- 2017 – today Water Works – Water Joint Programming Initiative 2018 (EU) Evaluator and member of the review panel
- 2016 – 2019 Austrian Academy of Sciences – Member of expert panel
- 2013 – 2018 Water Works 2014 ERA-NET (EU) Evaluator and member of the review panel

Awards and Scholarships:

- 2019 Ineson Lecturer “Urban hydrogeology”, prize of the British chapter of the International Association of Hydrogeologists (IAH) and the Hydrological Group of the Geological Society London
- 2007 Stimulus Award for Technology Transfer (UFZ) (Ceramic Toximeter Passive Sampler)
- 1999 Dresden Groundwater Research Prize
- 1998 University of Waterloo Graduate Scholarship
- 1997 University of Waterloo Graduate Scholarship
- 1996-97 University of Waterloo International Graduate Student Scholarship
- 1996 Davis Memorial Scholarship in Ecology
- 1995-96 Government of Canada Award
- 1993-95 Scholarship of the Gottlieb-Daimler- and Carl-Benz-Foundation, Germany
- 1993 Government of Baden-Württemberg Travel Award, Germany
- 1993 Dresden Centre for Groundwater Research Scholarship, Germany

Professional Memberships:

Section Hydrogeology in the German Geological Society
 National Ground Water Association
 Swiss Society of Hydrogeology
 International Association of Hydrogeology
 International Commission on Water Quality (ICWQ) of the International Association of Hydrological Sciences (IAHS)

Editorship:

- 2006 - 2009 Editor of the Journal “Grundwasser”
- 2003 - 2005 Associate Editor of the Journal “Grundwasser”

Contribution to Peer-reviewing of Journal Articles:

Water Resources Research	Journal of Hydrology
Journal of Contaminant Hydrology	Advances in Water Resources
Ground Water	Ground Water Monitoring and Remediation
Environmental Science & Technology	Water Research
Environmental Toxicology and Chemistry	Environmental Pollution
Water Science and Technology	Journal of Environmental Engineering & Science
Journal of Cleaner Production	Environmental Earth Sciences
Grundwasser	Regional Environmental Change
Hydrological Processes	Science of the Total Environment

List of Publications

Google Scholar (updated March 18, 2022):

https://scholar.google.com/citations?view_op=list_works&hl=en&user=rn2otYYAAAAJ

Published documents: 365

h-index: 44 (29 since 2017)

SCOPUS AU-ID "Schirmer, Mario" 7006161394

ORCID ID Schirmer, Mario: 0000-0002-0714-2525

Web of Science ResearcherID: L-9771-2016

Refereed Journal Publications

Pool, S., Francés, F., Garcia-Prats, A., Puertes, C., Pulido-Velazquez, M., Sanchis-Ibor, C., Schirmer, M., Yang, H., Jiménez-Martínez, J. 2022. Impact of a transformation from flood to drip irrigation on groundwater recharge and nitrogen leaching under variable climatic conditions. *Science of the Total Environment*, 825, 153805. <https://doi.org/10.1016/j.scitotenv.2022.153805>.

Azffri, S. L., Azaman, A., Sukri, R. S., Jaafar, S. M., Ibrahim, M. F., Schirmer, M., Gödeke, S. H. 2022. Soil and groundwater investigation for sustainable agricultural development: A case study from Brunei Darussalam. *Sustainability*, 14, 1388. <https://doi.org/10.3390/su14031388>.

Burri, N. M., Moeck, C., Schirmer, M. 2021. Groundwater recharge rate estimation using remotely sensed and ground-based data: A method application in the mesoscale Thur catchment. *Journal of Hydrology: Regional Studies*, 38, 100972. <https://doi.org/10.1016/j.ejrh.2021.100972>.

Weatherl, R., Salgado, M.J.H., Ramgraber, M., Moeck, C., Schirmer, M., 2021. Estimating surface runoff and groundwater recharge in an urban catchment using a water balance approach. *Hydrogeology Journal*, <https://doi.org/10.1007/s10040-021-02385-1>.

Pool, S., Francés, F., Garcia-Prats, A., Puertes, C., Pulido-Velazquez, M., Sanchis-Ibor, C., Schirmer, M., Yang, H., Jiménez-Martínez, J. 2021. Hydrological modeling of the effect of the transition from flood to drip irrigation on groundwater recharge using multi-objective calibration. *Water Resources Research*, 57, e2021WR029677. <https://doi.org/10.1029/2021WR029677>.

Pool, S., Francés, F., Garcia-Prats, A., Pulido-Velazquez, M., Sanchis-Ibor, C., Schirmer, M., Yang, H., Jiménez-Martínez, J. 2021. From flood to drip irrigation under climate change: Impacts on evapotranspiration and groundwater recharge in the Mediterranean region of Valencia (Spain). *Earth's Future*, 9, e2020EF001859. <https://doi.org/10.1029/2020EF001859>.

Ramgraber, M., Schirmer, M. 2021. Hydrogeological uncertainty estimation with the analytic element method. *Water Resources Research*, 57, e2020WR029509. <https://doi.org/10.1029/2020WR029509>.

- Ramgraber, M., Weatherl, R., Blumensaat, F., Schirmer, M. 2021. Non-Gaussian parameter inference for hydrogeological models using Stein variational gradient descent. *Water Resources Research*, 57, e2020WR029339. <https://doi.org/10.1029/2020WR029339>.
- Moeck, C., Popp, A. L., Brennwald, M. S., Kipfer, R., Schirmer, M. 2021. Combined method of $3\text{H}/3\text{He}$ apparent age and on-site helium analysis to identify groundwater flow processes and transport of perchloroethylene (PCE) in an urban area. *Journal of Contaminant Hydrology*, 238:103773. <https://doi.org/10.1016/j.jconhyd.2021.103773>.
- Betterle, A., Jaeger, A., Posselt, M., Coll, Cl., Benskin, J. P., Schirmer, M. 2021. Hyporheic exchange in recirculating fumes under heterogeneous bacterial and morphological conditions. *Environmental Earth Sciences*, 80:234. <https://doi.org/10.1007/s12665-021-09472-2>.
- Tayebzadeh Moghadam, N., Abbaspour, K. C., Malekmohammadi, B., Schirmer, M., Yavari, A. R. 2021. Spatiotemporal modelling of water balance components in response to climate and landuse changes in a heterogeneous mountainous catchment. *Water Resources Management*, <https://doi.org/10.1007/s11269-020-02735-w>.
- Bretzler, A., Nikiema, J., Lalanne, F., Hoffmann, L., Biswakarma, J., Siebenaller, L., Demange, D., Schirmer, M., Hug, S.J. 2020. Arsenic removal with zero-valent iron filters in Burkina Faso: Field and laboratory insights. *Science of the Total Environment*, 737. <https://doi.org/10.1016/j.scitotenv.2020.139466>.
- Ramgraber, M., Camporese, M., Renard, P., Salandin, P., Schirmer, M. 2020. Quasi-online groundwater model optimization under constraints of geological consistency based on iterative importance sampling. *Water Resources Research*, 56, e2019WR026777. <https://doi.org/10.1029/2019WR026777>.
- Dal Molin, M., Schirmer, M., Zappa, M., Fenicia, F. 2020. Understanding dominant controls on streamflow spatial variability to set up a semi-distributed hydrological model: the case study of the Thur catchment. *Hydrology and Earth System Sciences*, 24, 1319–1345, doi.org/10.5194/hess-24-1319-2020.
- Moeck, C., Molson, J., Schirmer, M. 2020. Pathline density distributions in a null-space Monte Carlo approach to assess groundwater pathways. *Groundwater*, 58 (2), 189-207. <https://doi.org/10.1111/gwat.12900>.
- Moeck, C., Grech-Cumbo, N., Podgorski, J., Bretzler, A., Gurdak, J. J., Berg, M., Schirmer, M. 2020. A global-scale dataset of direct natural groundwater recharge rates: a review of variables, processes and relationships. *Sci. Total Environ.*, 717, 137042 (19 pp.). <https://doi.org/10.1016/j.scitotenv.2020.137042>.
- Gödeke, S.H., Malik, O.A., Lai, D.T.C., Bretzler, A., Schirmer, M., Mansor, N.H. 2020. Water quality investigation in Brunei Darussalam: investigation of the influence of climate change. *Environmental Earth Sciences*, 79:419. <https://doi.org/10.1007/s12665-020-09157-2>

- Ramgraber, M., Albert, C., Schirmer, M. 2019. Data assimilation and online parameter optimization in groundwater modeling using nested particle filters. *Water Resources Research*, doi.org/10.1029/2018WR024408.
- Burri, N. M., Weatherl, R., Moeck, C., Schirmer, M. 2019. A review of threats to groundwater quality in the Anthropocene. *Science of the Total Environment*, 684, 136-154. <https://doi.org/10.1016/j.scitotenv.2019.05.236>.
- Bretzler, A., Stolze, L., Nikiema, J., Lalanne, F., Ghadiri, E., Brennwald, M., Rolle, M., Schirmer, M. 2019. Hydrogeochemical and multi-tracer investigations of arsenic-affected aquifers in semi-arid West Africa. *Geoscience Frontiers*, 10(5), 1685-1699. <https://doi.org/10.1016/j.gsf.2018.06.004>.
- Betterle, A., Schirmer, M., Botter, G. 2019. Flow dynamics at the continental scale: Streamflow correlation and hydrological similarity. *Hydrological Processes*, 33, 627–646. doi:10.1002/hyp.13350.
- Lewandowski, J., Arnon, S., Banks, E., Batelaan, O., Betterle, A., Broecker, T., Coll, C., Drummond, J.D., Garcia, J.G., Galloway, J., Gomez-Velez, J., Grabowski, R.C., Herzog S.P., Hinkelmann, R., Höhne, A., Hollender, J., Horn, M.A., Jaeger, A., Krause, S., Löchner Prats, A., Magliozzi, C., Meinikmann, K., Mojarrad, B.B., Mueller, B.M., Peralta-Maraver, I., Popp, A.L., Posselt, M., Putschew, A., Radke, M., Raza, M., Riml, J., Robertson, A., Rutere, C., Schaper, J.L., Schirmer, M., Schulz, H., Shanafield, M., Singh, T., Ward, A.S., Wolke, P., Wörman, A., Wu, L. Is the hyporheic zone relevant beyond the scientific community? 2019. *Water*, 11, 2230; doi:10.3390/w11112230.
- Moeck, C., Radny, D., Huggenberger, P., Affolter, A., Auckenthaler, A., Hollender, J., Berg, M., Schirmer, M. 2018. Verteilung anthropogen eingetragener Stoffe im Grundwasser: Ein Fallbeispiel aus der Nordschweiz. *Grundwasser*, 23, 297-309. <https://doi.org/10.1007/s00767-018-0403-6>.
- Moeck, C., von Freyberg, J., Schirmer, M. 2018. Groundwater recharge predictions in contrasted climate: The effect of model complexity and calibration period on recharge rates. *Environmental Modelling & Software*, 103, 74-89. <https://doi.org/10.1016/j.envsoft.2018.02.005>.
- Schomburg, A. Schilling, O.S., Guenat, C., Schirmer, M, Le Bayon, R.C., Brunner, P. 2018. Topsoil structure stability in a restored floodplain: Impacts of fluctuating water levels, soil parameters and ecosystem engineers. *Science of the Total Environment*, 639, 1610–1622. <https://doi.org/10.1016/j.scitotenv.2018.05.120>.
- Belletti, B., Nardi, L., Rinaldi, M., Poppe, M., Brabec, K., Bussettini, M., Comiti, F., Gielczewski, M., Golfieri, B., Hellsten, S., Kail, J., Marchese, E., Marcinkowski, P., Okruszko, T., Paillex, A., Schirmer, M., Stelmaszczyk, M., Surian, N. 2018. Assessing restoration effects on river hydromorphology using the process-based morphological quality index in eight European river reaches. *Environmental Management*, 61, 69–84, DOI 10.1007/s00267-017-0961-x.
- Radny, D., Schirmer, M., Luster, J., Guenat, C., Perona, P., Bayer, P., Stauffacher, M., Seidl, R., Hollender, J., Baumann, M. 2018. Flussrevitalisierungsforschung –

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Books

Schirmer, M., Hoehn, E., Vogt, T. (Editors). 2011. GQ10: Groundwater Quality Management in a Rapidly Changing World. Red Book, IAHS Publication No. 342. ISBN 978-1-907161-16-2.

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- Schirmer, M. 2005. SAFIRA (Sanierungsforschung in regional kontaminierten Aquiferen – alternative Sanierungstechniken). Altlasten-annual 2005. Hessisches Landesamt für Umwelt und Geologie. 115-121.
- Kaschl, A., Schirmer, M., Weiss, H. 2002. Prävention und Sanierung der Grundwasserverschmutzung an großflächig kontaminierten Standorten (WELCOME-Projekt). In: M. Laßl and S. Scholz (Eds), Berichte vom 18. Altlasten-Seminar 2002 und 13. Leipziger Altlasten-Seminar 2002, Schürmann + Klagges, Bochum, Germany, pp. 351-370.
- Fritz, P., Weiß, H. und Schirmer, M. 2000. Grundwassersanierung am Beispiel des Chemiedreiecks Buna-Leuna-Bitterfeld. 6. Internationale Sommerakademie St. Marienthal, Juli 2000.
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- Molson, J. W., Barker, J. F., Schirmer, M. 1999. Modeling the impact of ethanol on the persistence of BTEX compounds on gasoline-contaminated groundwater. Technical Report, The California MTBE Research Partnership, Gina Melin (Ed.), San Francisco, California, USA, NWRI-99-08; NWRI: Fountain Valley, CA.
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Record of Research Support

(Only includes projects externally funded and not funding provided by institutional resources internally)

2018 - 2024	RECONNECT - Regenerating ecosystems with nature-based solutions for hydro-meteorological risk reduction
Role: Co-PI	Vojinovic, Z. (35 partners)
	Project volume: Euro 13.5 Mio; Project part Schirmer Euro 359,122
	Funding agency: EU
2018 - 2021	IRRIWAM - Understanding the effects of irrigation modernization in water resources management – citrus production in the Jucar river basin, Spain
Role: Co-PI	Yang, H., Jimenez-Martinez, J., Schirmer, M.,
	Project volume: CHF 266,686
	Funding agency: ETH Zürich World Food System Center through the Coop-Foundation
2017 - 2021	Water Distribution - Adaptive monitoring and distributed modelling at catchment scale
Role: PI	Schirmer, M., Fenicia, F.
	Project volume: CHF 418,300
	Funding agency: Swiss National Science Foundation (SNF)
2016 - 2020	INSPIRATION - Managing soil and groundwater impacts from agriculture for sustainable intensification (Marie-Curie-Initial-Training-Network)
Role: Co-PI	Thornton, S. et al. (11 partners)
	Project volume: Euro 3.8 Mio; Project part Schirmer Euro 530,000
	Funding agency: EU

2015 – 2019	HypoTRAIN - Hyporheic Zone Processes – A training network for enhancing the understanding of complex physical, chemical and biological process interactions (Marie-Curie-Initial-Training-Network)
Role: Co-PI	Lewandowski, J. et al. (14 partners) Project volume: Euro 3.9 Mio; Project part Schirmer Euro 270,000 Funding agency: EU
2013 - 2017	Regional water supply Basel-Landschaft 21
Role: Co-PI	Von Gunten, U. (with 6 Co-PIs) Project volume: CHF 3,643,200; Project part Schirmer CHF 530,000 Funding agency: Canton Basel-Landschaft
2013 - 2016	River Floodplains – Groundwater / surface water interactions and hydrological variability of the Thur River catchment in northeastern Switzerland
Role: PI	Schirmer, M. Project volume: CHF 282,500 Funding agency: Swiss National Science Foundation (SNF)
2012 - 2017	RECORD Catchment - Coupled ecological, hydrological and social dynamics in restored and channelized corridors of a river at the catchment scale
Role: PI and Scientific Coordinator	Schirmer, M. et al. (12 partners) Project volume: CHF 5.38 Mio; Project part Schirmer CHF 1.69 Mio Funding agency: Competence Centre Environment and Sustainability (CCES) of the ETH domain
2012 - 2015	International Leibniz Graduate School: Aquatic boundaries and linkages in a changing environment (AQUALINK)
Role: Co-PI	Nützmann, G. et al. (8 partners) Project volume: Euro 871,000; Project part Schirmer Euro 91,200

Funding agency: Leibniz Association, Germany

2011 - 2015 REFORM - Restoring rivers for effective catchment management

Role: Co-PI with
Peter Reichert
and Hong Yang
at Eawag

Buijse, T. et al. (25 partners)

Project volume: Euro 5.0 Mio; Project part Eawag Euro 192,000

Funding agency: EU

**2011 - 2015 ADVOCATE - Advancing sustainable in situ remediation for
contaminated land and groundwater (Marie-Curie-Initial-Training-
Network)**

Role: Co-PI and
scientific
coordinator

Thornton, S. et al. (18 partners)

Project volume: Euro 5.9 Mio; Project part Schirmer Euro 479,000

Funding agency: EU

2010 - 2014 Alpine hydrogeology and climate change

Role: PI

Schirmer, M., Kipfer, R.

Project volume: CHF 312,500

Funding agency: Swiss National Science Foundation (SNF)

**2010 - 2013 Groundwater resources under changing climatic conditions
(GroundWaterTrend)**

Role: Co-PI

Hunkeler, D. Schirmer, M., Zwahlen, F., Perrochet, P., Renard, P.

Project volume: CHF 420,000

Funding agency: Swiss National Science Foundation (SNF) (NFP61)

**2010 - 2013 RIBACLIM - How can climate change affect water supply from
riverbank filtration?**

Role: Co-PI

von Gunten, U. Canonica, S., Hering, J., Kohler, H.-P., Schirmer, M.

Project volume: CHF 550,000

Funding agency: Swiss National Science Foundation (SNF) (NFP61)

2007 - 2011 **RECORD Project (Restored Corridor Dynamics) Assessment and modeling of coupled ecological and hydrological dynamics in the restored corridor of a river**

Role: PI and coordinator

Cirpka, O. et al. (10 partners) [Cirpka PI until Aug. 2008; Schirmer PI starting Sept. 2008]

Project volume: CHF 6.5 Mio; Project part Eawag CHF 1.88 Mio

Funding agency: Competence Centre Environment and Sustainability (CCES) of the ETH domain

2005 - 2006 **Vermeidung von Methanemissionen aus Hausmülldeponien durch den Einsatz einer biologisch aktiven Deponieabdeckung. (Prevention of methane emissions from waste sites using biologically active covers)**

Role: PI and coordinator

Schirmer, M., Barry, D.B., Martiensen, M.

Project volume: Euro 50,000

Funding agency: State Agency for Environmental Protection Saxony-Anhalt, Germany

2004 - 2007 **OXYWALL – Modellgestützte Feedbacksteuerung für modulare in situ Gaswände am Standort Leuna. (OXYWALL – model supported feedback controlling for modular in situ gas walls at the Leuna site)**

Role: Co-PI

Gerhardt, M., Schirmer, M., Martiensen, M.

Project volume: Euro 376,500; Project part Schirmer Euro 143,000

Funding agency: German Federal Ministry for Economy and Labour

2004 - 2009 **AQUATERRA - Integrated modelling of the river-sediment-soil-groundwater system; advanced tools for the management of catchment areas and river basins in the context of global change**

Role: Co-PI

Grathwohl, P. et al. (50 partners)

Project volume: Euro 13.0 Mio; Project part Schirmer Euro 438,000

Funding agency: EU

2002 - 2007	METHyltertiärbutylether (MTBE) – Leuna als Referenzstandort zur Implementierung des „Enhanced Natural-Attenuation“ Ansatzes (METLEN). (MTBE – Leuna as reference test site for the implementation of the enhanced natural attenuation concept)
Role: PI	Schirmer, M. et al. (4 partner institutions) Project volume: Euro 1,295,000; Project part Schirmer Euro 511,000 Funding agency: German Federal Ministry for Education and Research
2000 - 2003	REferenzTestfeld Zeitz zur Implementierung des „Natural-Attenuation“-Ansatzes (RETZINA). (Reference test site Zeitz for the implementation of the natural attenuation concept)
Role: Co-PI	Teutsch, G. et al. (3 partner institutions) Project volume: Euro 490,000; Project part Schirmer Euro 108,000 Funding agency: German Federal Ministry for Education and Research
2000	Support for patent application on an “Environmental sampling device for the toxicological assessment of hydrophobic contaminants in surface and ground water“
Role: Co-PI	Schirmer, K., Bols, N. C., Schirmer, M. Project volume: CND\$ 15,000 Funding agency: CRESTech (Centre for Research in Earth and Space Technology), Ontario, Canada
1999	Modeling study of the impact of ethanol on the persistence of BTEX compounds on gasoline-contaminated groundwater
Role: Co-PI	Barker, J. F., Molson, J. W., Schirmer, M. Project volume: CND\$ 95,000 Funding agency: California MTBE Research Partnership, San Francisco, California, USA
1999	Study of dissolution and biodegradability of MTBE at the Vandenberg field site, California (part 2 of project)

Role: Co-PI	Mackay, D. M., Schirmer, M, Einarson, M. and Wilson, R. Project volume: CND\$ 205,000 Funding agency: American Petroleum Institute, Washington, DC, USA
1998 - 2000	Development of an environmental sampling device for the toxicological assessment of hydrophobic contaminants in surface and ground water
Role: Co-PI	Bols, N. C., Barker, J. F., Schirmer, K. and Schirmer, M. Project volume: CND\$ 280,000 Funding agency: CRESTech (Centre for Research in Earth and Space Technology), Ontario, Canada
1998 - 1999	A new model for simulating multi-component enhanced NAPL dissolution and biodegradation
Role: Co-PI	Frind, E. O., Lasage, S., Molson, J., Smith, J. and Schirmer, M. Project volume: CND\$ 130,000 Funding agency: CRESTech (Centre for Research in Earth and Space Technology), Ontario, Canada
1997 - 1998	Laboratory batch experiments using Borden sand and groundwater to determine the fate of MTBE
Role: Co-PI	Barker, J. F., Butler, B. J. and Schirmer, M. Project volume: CND\$ 155,000 Funding agency: American Petroleum Institute, Washington, DC, USA
1997 - 1999	Study of dissolution and biodegradability of MTBE at the Vandenberg field site, California
Role: Co-PI	Mackay, D. M., Schirmer, M, Hubbard, C., Einarson, M., Chapman, S. and Wilson, R. Project volume: CND\$ 950,000 Funding agency: American Petroleum Institute, Washington, DC, USA

1996 - 1997	Delineation and characterization of the Borden MTBE plume
Role: Co-PI	Barker, J. F. and Schirmer, M. Project volume: CND\$ 320,000 Funding agency: American Petroleum Institute, Washington, DC, USA
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1995	3D Biodegradation modeling of two benchmark problems
Role: Co-PI	Frind, E. O., Schirmer, M. and Molson, J. W. Project volume: CND\$ 21,000 Funding agency: American Petroleum Institute, Washington, DC, USA
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1993 - 1995	Scholarship for two years for project: "Numerical modelling of biodegradation processes" at the University of Waterloo, Ontario, Canada
Role: Awardee	Schirmer, M. Project volume: CND\$ 130,000 Funding agency: Gottlieb-Daimler- and Carl-Benz-Foundation, Germany

References

Prof. em. Dr. Emil O. Frind
Department of Earth Sciences
200 University Avenue West
University of Waterloo
Waterloo, N2L 3G1, ON
Canada

Phone: +1 519-888-4567 Ext. 33959
Fax: +1 519-746-7484
E-mail: frind@uwaterloo.ca

Prof. em. Dr. Emil Frind
346 Marlowe Drive
Waterloo, N2L 5A4, ON
Canada

Phone: +1 519-885-4415

Prof. em. Dr. Peter Fritz

former Scientific Director Helmholtz Centre for Environmental Research – UFZ
Eichenweg 7
04827Machern
Germany

Phone: +49 34292 75747
Mobile: +49 160 8455544
E-mail: peter.fritz@ufz.de

Prof. Dr. sc. nat. Rolf Kipfer

Eawag, Swiss Federal Institute for Aquatic Science and Technology
Dept. of Water Resources and Drinking Water
Ueberlandstrasse 133
CH-8600 Dübendorf
Switzerland

Phone: +41 58 765 5530
Fax: +41 58 765 5210
Email: rolf.kipfer@eawag.ch