

CURRICULUM VITAE

Prof. Dr. habil. MARIO SCHIRMER



August 24, 2020

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Prof. Dr. habil. MARIO SCHIRMER

Eawag - Swiss Federal Institute of Aquatic Science
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 Department Water Resources and Drinking Water (W+T)
 Research Group Hydrogeology
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 Switzerland

Residence:
 Guggenbühlstrasse 15
 CH-8304 Wallisellen
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Phone: +41 58 765 5382

Citizenship: Swiss, Canadian

Date of Birth: July 24, 1964

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

Education:

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| 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:

Head 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
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:

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:

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

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

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

Board Memberships:

- 2018-today Member of the Swiss Hydrological Commission (CHy), Geosciences Platform of the Swiss Academy of Sciences
- 2010-15 Scientific Advisory Board German Centre for Groundwater Research, Dresden, Germany
- 2010-14 Advisory Board Section Hydrogeology within the German Association of Geosciences

Awards and Scholarships:

- 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:

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| 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 August 24, 2020):

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

Published documents: 355

h-index: 41 (28 since 2015)

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

Refereed Journal Publications

- 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>.
- 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.
- Moeck, C., Molson, J., Schirmer, M. 2019. Pathline density distributions in a Null-Space Monte Carlo approach to assess groundwater pathways. *Groundwater*, 1-19. doi: 10.1111/gwat.12900
- 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., Bussetini, 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 – Wissenschaftliche Erkenntnisse im Rahmen zweier Forschungsprojekte im Einzugsgebiet der Thur. *Aqua & Gas*, 4, 30–38.
- Moeck, C., Affolter, A., Radny, D., Dressmann, H., Auckenthaler, A., Huggenberger, P., Schirmer, M. 2018. Improved water resource management for a highly complex environment using three-dimensional groundwater modelling. *Hydrogeology Journal*, 26, 133–146, DOI 10.1007/s10040-017-1640-y.

- Minnig, M., Moeck, C., Radny, D., Schirmer, M. 2018. Impact of urbanization on groundwater recharge rates in Dübendorf, Switzerland. *Journal of Hydrology*, 563, 1135–1146, doi.org/10.1016/j.jhydrol.2017.09.058.
- Betterle, A., Radny, D., Schirmer, M., Botter, G. 2017. What do they have in common? Drivers of streamflow spatial correlation and prediction of flow regimes in ungauged locations. *Water Resources Research*, 53, 10, 354–10,373, doi.org/10.1002/2017WR021144.
- Betterle, A., Schirmer, M., Botter, G. 2017. Characterizing the spatial correlation of daily streamflows, *Water Resources Research*, 53(2), 1646-1663, doi.org/10.1002/2016WR019195.
- Moeck, C., Radny, D., Popp, A., Brennwald, M., Stoll, S., Auckenthaler, A., Berg, M., Schirmer, M. 2017. Characterization of a managed aquifer recharge system using multiple tracers, *Science of the Total Environment*, 609, 701–714.
- Bretzler, A., Lalanne, F., Nikiema, J., Podgorski, J., Pfenninger, N., Berg, M., Schirmer, M. 2017. Corrigendum to “Groundwater arsenic contamination in Burkina Faso, West Africa: Predicting and verifying regions at risk” [*Sci. Total Environ.* 584–585 (2017) 958–970]. *Science of the Total Environment*, 598, 562. <http://dx.doi.org/10.1016/j.scitotenv.2017.04.098>
- Moeck, C., Radny, D., Auckenthaler, A., Berg, M., Hollender, J., Schirmer, M. 2017. Estimating the spatial distribution of artificial groundwater recharge using multiple tracers, *Isotopes in Environmental and Health Studies*, 53(5), 484-499, <https://doi.org/10.1080/10256016.2017.1334651>.
- Bretzler, A., Lalanne, F., Nikiema, J., Podgorski, J., Pfenninger, N., Berg, M., Schirmer, M. 2017. Groundwater arsenic contamination in Burkina Faso, West Africa: Predicting and verifying regions at risk. *Science of the Total Environment*, 584–585, 958–970. <http://dx.doi.org/10.1016/j.scitotenv.2017.01.147>.
- Doulatyari, B., Betterle, A., Radny, D., Celegon, E. A., Fanton, P., Schirmer, M., Botter, G. 2017. Patterns of streamflow regimes along the river network: The case of the Thur river. *Environmental Modelling & Software*, 93, 42-58.
- Ghasemizade, M., Baroni, G., Abbaspour, K., Schirmer, M. 2017. Combined analysis of time-varying sensitivity and identifiability indices to diagnose the response of a complex environmental model. *Environmental Modelling & Software*, 88, 22-34.
- Möck, C., Radny, D., Stoll, S., Borer, P., Rothardt, J., Affolter, A., Huggenberger, P., Auckenthaler, A., Hollender, J., Berg, M., Schirmer, M. 2017. Multivariate Statistik zur Optimierung des Wasserressourcenmanagements im Hardwald. *Aqua & Gas*, 2, 14–20.
- Basso, S., Schirmer, M., Botter, G. 2020. A physically based analytical model of flood frequency curves. *Geophys. Res. Lett.* 2016, 43 (17), 9070-9076. <https://doi.org/10.1002/2016GL069915>.

- Moeck, C., Radny, D., Borer, P., Rothardt, J., Auckenthaler, A., Berg, M., Schirmer, M. 2016. Multicomponent statistical analysis to identify flow and transport processes in a highly-complex environment. *Journal of Hydrology*, 542, 437-449.
- Chittoor Viswanathan, V., Jiang, Y., Berg, M., Hunkeler, D., Schirmer, M. 2016. An integrated spatial snap-shot monitoring method for identifying seasonal changes and spatial changes in surface water quality. *Journal of Hydrology*, 539, 567–576.
- Odeh, T., Gloaguen, R., Mohammad, A. H., Schirmer, M. 2016. Structural control on drainage network and catchment area geomorphology in the Dead Sea area: an evaluation using remote sensing and geographic information systems in the Wadi Zerka Ma'in catchment area (Jordan). *Environmental Earth Sciences*, 75(6), 482. DOI 10.1007/s12665-016-5447-2.
- Doulatyari, B., Betterle, A., Basso, S., Biswal, B., Schirmer, M., Botter, G. 2015. Predicting streamflow distributions and flow duration curves from landscape and climate. *Advances in Water Resources*, 83, 285–298.
- Basso, S., Frascati, A., Marani, M., Schirmer, M., Botter, G. 2015. Climatic and landscape controls on effective discharge. *Geophysical Research Letters* 42(20), 8441-8447.
- Ghasemizade, M., Moeck, C., Schirmer, M. 2015. The effect of model complexity in simulating unsaturated zone flow processes on recharge estimation at varying time scales. *Journal of Hydrology*, 529, 1173–1184. Online available: DOI.org/10.1016/j.jhydrol.2015.09.027.
- Badin, A., Schirmer, M., Wermeille, D., Hunkeler, D. 2015. Perchlorethen-Quellendifferenzierung mittels Kohlenstoff-Chlor-Isotopenanalyse: Felduntersuchungen zur Beurteilung der Variabilität der Isotopensignatur. *Grundwasser*, 20(4), 263-270.
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German patent DE 44 29 136. German Patent Office Munich.
Canadian patent application ref. # K0519519. Application filed on March 06, 1996.

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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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Book Chapters

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Other Journal Publications

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- Schirmer, M., Weiß, H. 1999. Einfluß refraktärer Substanzen wie Methyltertiärbutylether (MTBE) auf den “Natural Attenuation“-Ansatz in Grundwasserleitern. *Altlastenspektrum*, 6/99, 340-344.

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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.

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Record of Research Support

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

| | |
|--------------------|--|
| 2018 - 2023 | RECONNECT - Regenerating ecosystems with naturebased 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 - 2020 | 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

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| 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) |

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| 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 |

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| 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

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