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EDUCATION & TRAINING

2012 – 2014		Management Academy (Helmholtz Akademie für Führungskräfte), „Certified Manager“ (Malik Management Zentrum St. Gallen)
2013	Habilitation	Habilitation in “Hydrology”, Faculty for Biology, Chemistry & Geosciences, University of Bayreuth
1999 – 2004	Ph.D.	Hydrologic Sciences, Sept. 2004, University of California, Davis, USA Dissertation: “Simulation of river aquifer interactions in a heterogeneous alluvial fan system”, Advisor: Graham E. Fogg
2002		“Advanced Study Course on River Basin Modeling for Flood Risk Mitigation”, Oct. 2002, Department of Civil Engineering, University of Birmingham, UK
1997 – 1998	M.Sc.	Hydrologic Sciences, Mar. 1999 University of California, Davis, USA Non thesis option, average GPA 3.86 (out of 4)
1992 – 1993		Graduate exchange student, Department of Geography, McMaster University, Ontario, Canada, course work in Karst hydrology and geomorphology, one academic year, Advisor, Prof. D. Ford
1990 – 1997	Diplom	Geography, minors: Geology, Geophysics, Feb. 1997, Free University of Berlin, Grade: 1.0 (A) with distinction, Thesis: “Groundwater quality and hydraulic conditions of the cenozoic aquifers in Berlin Zehlendorf”, Advisor: Prof. A. Pekdeger.

PROFESSIONAL EXPERIENCE

Since 2017	Professor for Hydrologic Modeling, University of Bayreuth
Since 2010	Head of the Department of Hydrogeology at Helmholtz Center for Environmental Research, UFZ
2004 – 2010	C1 Researcher / Assistant Professor level (“wissenschaftlicher Assistent”, C1), head of the hydrologic modeling group at the Department of Hydrology, University of Bayreuth, responsibilities: research, teaching, IT
1999 - 2004	Research assistant, Department of Land, Air and Water Resources, University of California, Davis, USA
1997	Affiliated scientist, Hydrology group (Dr. A. Bronstert), Potsdam Institute for Climate Impact Research (PIK), application and testing of the HBV-96 rainfall-runoff model for a meso-scale catchment, calibration and sensitivity analysis, 4 months
1996 - 1997	Coordinator of field campaigns to assess the hydraulic and hydrochemical conditions of deep drinking water aquifers of a district in West Berlin, Hydrogeology group (Prof. A. Pekdeger), Free University of Berlin

OTHER WORK EXPERIENCE

- 2001 & 2003 Freelance consultant with „EL Associates“, Davis, California, USA
Preparation of input data for a groundwater model for the simulation of MTBE plumes, GIS data base for an assessment of groundwater vulnerability in Sacramento County, California
- 1999 Freelance consultant at „Center for Urban Forest Research“, US Forest Service, Davis
Preparation of a report on concepts and models for the assessment of the impacts of urban forests on runoff quantity and quality
- 1995 Field assistant in a DFG research expedition to Badan Jirin dessert, Inner Mongolia, Department of Geography (Dr. J. Hofmann), Free University of Berlin, 3 months
Collection and analysis of water samples from salt lakes.
- 1993 Field assistant in the EU project “EUROSLOPE”, Department of Geography (Prof. P. Ergenzinger), Free University of Berlin, 1 month
Surveying stream cross-sections and measuring bed load

AWARDS AND SCHOLARSHIPS

Best Poster Award: “Quantifying the spatial and temporal variability of groundwater- lake exchange” by Nina Volze (M.Sc. student), Christiane Neumann (Ph.D. student) and Jan H. Fleckenstein, Conference of the Hydrogeology Section of the German Geologic Society (FH-DGG), Göttingen, 2009

Recognition Award for dissertation, Dresden Groundwater Research Centre (DGFZ), 2007

Best practice oriented paper award, Journal of Water Resources Planning and Management, EWRI of ASCE, 2005 (http://www.ewrinstitute.org/inside/ewri_awardwinners2005.cfm#JulianHinds)

Best Poster Award, 2000 CALFED Science Conference, 3.-5. Oct. 2000, Sacramento, CA

Jastro Shields Research Awards, University of California, Davis, 1999, 2000 & 2001

Non Resident Tuition Fellowships, University of California, Davis

DAAD Postgraduate Scholarship (1 year), 1997-1998

Fellow of German National Academic Foundation (Studienstiftung des Deutschen Volkes), 1992-97

DAAD IAS-Stipendium, McMaster University, Canada, 08/1992-06/1993

RESEARCH GRANTS

DFG (German Research Foundation) FL613/5-1, Quantification and simulation of the spatial and temporal variability of groundwater-lake exchange, Sept. 2007 to Aug. 2010, €160000

DFG (German Research Foundation) BI563/14-1, Impact of long-term N deposition on nitrogen transformations and translocation in a northern peatland, together with Dr. C. Blodau, Oct. 2007 to Sept. 2010, €115000

BaCaTeC (Bavaria California Technology Center), Using fiber optics for distributed temperature sensing (DTS) in groundwater-surface water systems, travel grant, Jul. 2007 to Dec. 2008, €4000

DFG (German Research Foundation): DFG FL631/6-2, Structurally optimized modeling of non-linear effects of meteorological extreme events on water and solute dynamics, Apr. 2008 to Mar. 2011, €222000

DFG (German Research Foundation): Identification of source areas and the role of hyporheic exchange and the riparian zone in NO₃ and DOC export from catchments, as part of the TERRECO international research training group (DFG/KOEF-IRTG), €120000

International Bureau of the BMBF (CAN 08/A08): Simulation of the effects of extreme climatic conditions on water and solute dynamics, International Cooperation Grant, project partner, Prof. E. Sudicky, University of Waterloo, Canada, €4500

German Israeli Foundation (GIF Grant No. 1158-132.8/2011): Impact of losing versus gaining stream flow conditions on temperature gradients and oxygen consumption in heterogeneous streambeds, co-PIs Dr. Christian Schmidt, Helmholtz Center for Environmental Research, Prof. Shai Arnon, Ben Gurion University of the Negev, Israel, Jan. 2013 to Dec. 2015, €180000

BMBF, PT KIT Dresden (02WT1290A): Belastung von Trinkwassersperren durch gelösten organischen Kohlenstoff Prognose, Vorsorge, Handlungsoptionen (TALKO), PIs Dr. Jan H. Fleckenstein and Dr. Andreas Musolff, Helmholtz Center for Environmental Research, Nov.2012 to Oct. 2015, €307350

EU International Training Network "INTERFACES" (PITN-GA-2013-607150): Ecohydrological interfaces as critical hotspots for transformations of ecosystem exchange fluxes and biogeochemical cycling, participating partner, PIs Dr. Christian Schmidt and Dr. Jan H. Fleckenstein, Helmholtz Center for Environmental Research, Nov.2013 to Oct. 2017, €226500

EU International Training Network "ENIGMA" (PITN-GA-2017-722028): European training Network for in situ imaging of dynamic processes in heterogeneous subsurface environments, participating partner, PIs PD Dr. Jan H. Fleckenstein, Dr. Nico Trauth, Dr. Ulrike Werban, Helmholtz Center for Environmental Research, Jan. 2017 to Dec. 2020, €249200

DFG (German Research Foundation) FL613/7-2, Collaborative Research Center – CRC 1253 (SFB1253) Subproject P2: Pollutant Turnover in the Groundwater - Stream Transition Zone of Contrasting Lower-Order Sub-Catchments, PIs: PD Dr. Jan H. Fleckenstein, Dr. Marc Schwientek, PD Dr. Martin Elsner, PD Dr. Tillmann Lüders, Jan. 2017 to Dec. 2020, €240000

DFG (German Research Foundation) FL613/8-2, Collaborative Research Center – CRC 1357 (SFB1357) Subproject B02: Transport and behavior of microplastic in lakes, PIs: Prof Dr. Jan H. Fleckenstein, Dr. Benjamin Gilfedder, Jan. 2019 to Dec. 2022, €220000

DFG (German Research Foundation) FL613/9-2, Collaborative Research Center – CRC 1357 (SFB1357) Subproject B03: Transport and fate of microplastic in streams, the hyporheic zone and groundwater, PIs: Prof Dr. Jan H. Fleckenstein, Dr. habil. Sven Frei, Jan. 2019 to Dec. 2022, €220000

DFG (German Research Foundation) FL613/9-2, Collaborative Research Center – CRC 1357/2 (SFB1357/2) Subproject B03: Behavior of microplastic in the system stream/hyporheic zone, PIs: Prof Dr. Jan H. Fleckenstein, Prof. Dr. Sven Frei, Jan. 2023 to Dec. 2026, €370500

BMBF, PT KIT Karlsruhe (02WGW1664C): Stimulation of H₂/CH₄-oxidizing bacteria in porous aquifers for the purification of nitrate-loaded groundwater for drinking water production (Nitratlurch), PI Prof. Dr. Jan H. Fleckenstein, Helmholtz Center for Environmental Research, Mar. 2023 to Feb. 2026, €273522

TRAVEL GRANTS

DAAD presentation, USGS, Water Resources Division, Menlo Park, Sept. 2009

DFG FL 631/4-1 conference, HydroEco'2006, Karlovy Vary, Czech Republic, Sept. 2006.

DFG, FL 631/3-1 presentation, Lawrence Livermore National Laboratory, USA, Dez. 2005

PROFESSIONAL MEMBERSHIPS

FH-DGG, Hydrogeology Section of the German Geologic Society (FH-DGG)

DWA, Hydrologic Sciences Section of the German Association for Water and Wastewater

AGU, American Geophysical Union

EGU, European Geosciences Union

IAHS, International Association of Hydrologic Sciences

IAH, International Association of Hydrogeologists

PROFESSIONAL SERVICE

EDITORSHIPS

Associate Editor, Water Resources Research since 2020

Associate Editor, *Hydrogeology Journal* 2009 to 2012 (2015 request to become editor, declined)

SPECIAL ISSUES, SECTIONS AND THEME ISSUES ORGANIZED AND EDITED

Hydrological Processes, special issue: "Hyporheic Hydrology, Interactions at the Groundwater-Surface Water interface", 2009

Grundwasser, theme issue: „Grundwasser-Oberflächenwasser-Interaktionen“ (groundwater-surface water interactions), 2009

Advances in Water Resources, special issue: "Groundwater-Surface Water Interactions", 2010

Water Resources Research, special section: "Groundwater-Surface Water Interactions", 2013

REVIEWER OF MANUSCRIPTS FOR SCIENTIFIC JOURNALS (ONLY JOURNALS I FREQUENTLY REVIEW FOR ARE LISTED)

Water Resources Research

Journal of Hydrology

Journal of Geophysical Research – Biogeosciences

Advances in Water Resources

Hydrological Processes

Hydrology and Earth System Sciences

Environmental Sciences and Technology

Geophysical Research Letters

Grundwasser

Nature

REVIEWER OF SCIENTIFIC RESEARCH GRANT PROPOSALS

Deutsche Forschungsgemeinschaft – DFG (German Research Foundation)

National Science Foundation (NSF), USA

TECHNICAL COMMITTEES AND WORKGROUPS

American Geophysical Union (AGU), Groundwater Technical Committee, 2013 – present

DWA (German Association for Water and Wastewater), Work Group: "Interactions between Groundwater and Surface Water", 2010 – 2020

SCIENTIFIC ADVISORY COMMITTEES (SAC)

Member of SAC, HydroEco Conferences, 2011, 2013 and 2015

Member of SAC, Tag der Hydrologie, DWA (Hydrology Days), Vienna 2011

CONFERENCE SESSIONS CHAIRED AND ORGANIZED

EGU – European Geosciences Union, convener of technical sessions

2007, HS23: Hydrological, chemical and biological processes in rivers and riparian zones

2008, HS7.4: Hydroecology of riparian zones: hyporheic controls at the groundwater-surface water interface

2009, HS9.5: Hydrological, biogeochemical and hydroecological processes and interactions at the groundwater surface water interface (hyporheic zone)

2010, HS3.5: Interactions between surface water, groundwater, and the hyporheic zone

2011, HS10.3: Interactions between surface water, groundwater, and the hyporheic zone

2012, HS10.7: Interactions between surface water, groundwater, and the hyporheic zone

2013, HS10.7: Interactions between surface water, groundwater, and the hyporheic zone

2014, HS2.3.9: GW-SW interactions: concepts, methods & biogeochemical & ecologic implications

2015, HS10.11: GW-SW interactions: concepts, methods & biogeochemical & ecologic implications

2016, HS10.11: GW-SW interactions: biogeochemical and ecological processes
2017, HS10.10: GW-SW interactions: biogeochemical and ecological processes
2018, HS10.10: GW-SW interactions: biogeochemical and ecological processes
2019, HS10.8: GW-SW interactions: Physical, biogeochemical and ecological processes
2020, HS10.7: GW-SW Interactions: Physical, Biogeochemical and Ecological processes
2021, HS10.9: GW-SW Interactions: Physical, Biogeochemical and Ecological processes
2022, HS10.8: GW-SW Interactions: Physical, Biogeochemical and Ecological processes
2023, HS10.8: GW-SW Interactions: Physical, Biogeochemical and Ecological processes
2024, HS10.5: GW-SW Interactions: Physical, Biogeochemical and Ecological processes

AGU – American Geophysical Union, convener of technical sessions

2010, H31D Groundwater-surface water interactions, process patterns and dynamics
2011, H33I: Groundwater-surface water interactions: experimental tracers, monitoring, & modeling techniques:
2012, H14B: Groundwater-surface water interactions: dynamics across spatial and temporal scales
2013, H31L: Groundwater-surface water interactions: physical, biological, and chemical relevance
2015, H33C Groundwater-surface water interactions: identifying and integrating physical, biological and chemical processes
2017, H52D Linking dynamic watershed processes across spatial and temporal scales

FH-DGG – Hydrogeology Section of the German Geologic Society, convener of technical sessions

2012, Session B3: Groundwater-surface water interactions
2014, Session O6: Groundwater, soil and surface water interactions
2018, Session O9: Grundwasser-Oberflächenwasser Interaktionen: Prozesse und Methoden

Computational Methods in Water Resources (CMWR), convener of technical sessions

2018, Session 17: Modeling solute turnover within landscapes and export by rivers from local to global scales

IAH – International Association of Hydrogeologists, IAH2024 Davos – World Groundwater Congress

2024, Session 1.13: Groundwater – Surface Water Interactions (Convenor)

CONFERENCES, WORKSHOPS AND TRAINING COURSES ORGANIZED OR HELD

Training courses for the German Association for Water and Wastewater (DWA), Wechselwirkungen zwischen Grundwasserleitern und Oberflächengewässern; Erfurt, Sept. 11, 2014; Siegburg Sept. 11, 2015, Ulm Sept. 11, 2016, Würzburg Nov. 26, 2019

3rd Workshop of the German Hyporheic Network, UFZ-Leipzig, October 7-9, 2013 (organized)

4th Internat. HydroGeoSphere User Conference, University of Bayreuth, Mar. 6-8, 2017 (organized)

FUNCTIONS WITHIN THE HELMHOLTZ RESEARCH PROGRAM (POF)

From 2013 to 2020, **Speaker of the Integrated Project: “Water and Matter Flux Dynamics in Catchments”**, a multi-disciplinary research consortium bringing together expertise in hydrology, biogeochemistry, soil physics, aquatic ecology, geophysics and environmental analytics within the Helmholtz Research Program, phase III (POFIII), <https://www.ufz.de/index.php?en=47200>

From 2021 to 2026 **Speaker of the Integration Platform: “Freshwater Resources”** as part of the Helmholtz Research Program, phase IV (POFIV), <https://www.ufz.de/index.php?en=48617>

PUBLICATIONS

CITATION METRICS	WEB OF SCIENCE	SCOPUS	GOOGLE SCHOLAR
# of publications:	120	119	349
# of citations	5799	6130	8550
h-index	46	48	54

My researcher profile on Web of Science: <https://www.webofscience.com/wos/author/record/B-1382-2014>

My profile on ORCID: <https://orcid.org/0000-0001-7213-9448>

My profile on Google Scholar: <https://scholar.google.de/citations?user=UYjSL-EAAAAJ&hl=en>

PEER REVIEWED PUBLICATIONS (ISI- AND SCOPUS LISTED)

- 126) Bähge, A., Ruz Vargas, C., Lischeid, G., Collenteur, R., Cuthbert, M., **Fleckenstein, J.H.**, Flörke, M., de Graaf, I., Gnann, S., Hartmann, A., Huggins, X., Moosdorf, N., Wada, Y., Wagener, T., Reinecke, R. (2026) A global-scale time series dataset for groundwater studies within the Earth system, *Scientific Data*, 13 <https://doi.org/10.1038/s41597-026-06966-1>
- 125) Elagami, H., Ahmadi, P., **Fleckenstein, J.H.**, Thomas, C.K., Babel, W., La Capra, M., Frei, S., Gilfedder, B.S. (2026) Summer hydrodynamics as a dual driver of microplastic retention and settling in shallow water columns, *Water, Air and Soil Pollution*, 237(15) <https://doi.org/10.1088/1748-9326/ae44b0>
- 124) Nguyen, V.T., Musolff, A., Ebeling, P., Sarrazin, F.J., **Fleckenstein, J.H.**, Attinger, S., Kumar, R. (2026) Long-term assessment of point source contributions to nitrate pollution in the Central European Rhine and Elbe river basins, *Environmental Research Letters*, 21(4) <https://doi.org/10.1088/1748-9326/ae44b0>
- 123) Pardo-Álvarez, A., **Fleckenstein, J.H.**, Koutantou, K., Brunner, P. (2026) darcyInterTransportFoam v1.0: an open-source, fully-coupled 3D solver for simulating surface water – saturated groundwater processes and exchanges, *Geoscientific Model Development*, 19(9):3923–3951 <https://doi.org/10.5194/gmd-19-3923-2026>
- 122) Sodoge, J., Kuhlicke, C., Di Baldassarre, G., **Fleckenstein, J.H.**, Ebeling, P., de Brito, M.M. (2026) Emerging hotspots of groundwater conflicts during droughts in Germany, *iScience* 29 (7), art. 116338, <https://doi.org/10.1016/j.isci.2026.116338>
- 121) Ebeling, P., Musolff, A., Kumar, R., Hartmann, A., **Fleckenstein, J.H.** (2025) Groundwater head responses to droughts across Germany, *Hydrology and Earth System Sciences*, 29: 2925-2950 <https://doi.org/10.5194/hess-29-2925-2025>
- 120) Huang, X., Ebeling, P., Liu, G., **Fleckenstein, J. H.**, & Schmidt, C. (2025). Combining local head differences and topography-driven groundwater flow reveals gaining and losing patterns in stream networks. *Water Resources Research*, 61, e2024WR037443.118), <https://doi.org/10.1029/2024WR037443>
- 119) Soltanian, M.R., Moeini, F., Dai, Z., Sawyer, A.H., **Fleckenstein, J.H.**, Doherty, J., Curtis, Z., Chaudhuri, A., Chiogna, G., Fahs, M., Han, W.S., Mseli, Z.H., Lotti, F., Moon, H.S., Zhou, L., Al-Masri, D., Zhan, C., Hoteit, H., Matin, M.A., Zarei, A., Carroll, K.C., Evans, S.G., Madani, K. (2024) Sustainability Nexus AID: groundwater, *Sustainability Nexus Forum* 32:21, <https://doi.org/10.1007/s00550-024-00557-7>
- 118) Borriero, A., Nguyen, T.V., Lutz, S.R., **Fleckenstein, J.H.**, Musolff, A., Kumar R. (2024) Can the young water fraction reduce predictive uncertainty in water transit time estimations?, *Journal of Hydrology*, 645:132238, <https://doi.org/10.1016/j.jhydrol.2024.132238>
- 117) Nogueira, E.H., Partington, D., Heidbüchel, I., **Fleckenstein, J.H.** (2024) Combined effects of geological heterogeneity and discharge events on groundwater and surface water mixing, *Journal of Hydrology*, 638:131467, <https://doi.org/10.1016/j.jhydrol.2024.131467>

- 116) Borriero, A., Musolff, A. Kumar, R. **Fleckenstein, JH.**, Lutz, S., Nguyen, T.V. (2024). The value of instream stable water isotope and nitrate concentration data for calibrating a travel time-based water quality model, *Hydrological Processes*, 38:e15154, <https://doi.org/10.1002/hyp.15154>
- 115) Ahmadi, P., F. Dichgans, L. Jagau, C. Schmidt, V. Aizinger, B. S. Gilfedder, and **J. H. Fleckenstein** (2024). Systematic CFD-based evaluation of physical factors influencing the spatiotemporal distribution patterns of microplastic particles in lakes. *Science of the Total Environment*, 917, <https://doi.org/10.1016/j.scitotenv.2024.170218>
- 114) Boos, J. P., F. Dichgans, **J. H. Fleckenstein**, B. S. Gilfedder, and S. Frei (2024). Assessing the Behavior of Microplastics in Fluvial Systems: Infiltration and Retention Dynamics in Streambed Sediments. *Water Resources Research*, 60(2), <https://doi.org/10.1029/2023WR035532>
- 113) Boico, V. F., R. Therrien, **J. H. Fleckenstein**, G. Nogueira, B. V. Iversen, and R. J. Petersen (2023). 3D surface-subsurface modeling of a bromide tracer test in a macroporous tile-drained field: Improvements and limitations. *Soil Science Society of America Journal*, 87(3), 462-484, <https://doi.org/10.1002/saj2.20537>
- 112) Borriero, A., R. Kumar, T. V. Nguyen, **J. H. Fleckenstein**, and S. R. Lutz (2023). Uncertainty in water transit time estimation with StorAge Selection functions and tracer data interpolation. *Hydrology and Earth System Sciences*, 27(15), 2989-3004, <https://doi.org/10.5194/hess-27-2989-2023>
- 111) Dichgans, F., J. P. Boos, P. Ahmadi, S. Frei, and **J. H. Fleckenstein** (2023). Integrated numerical modeling to quantify transport and fate of microplastics in the hyporheic zone. *Water Research*, 243, <https://doi.org/10.1016/j.watres.2023.120349>
- 110) Hermans, T., P. Goderniaux, D. Jougnot, **J. H. Fleckenstein**, P. Brunner, F. Nguyen, N. Linde, J. A. Huisman, O. Bour, J. L. Alvis, R. Hoffmann, A. Palacios, A. K. Cooke, A. Pardo-Alvarez, L. Blazevic, B. Pouladi, P. Haruzi, A. F. Visentini, G. E. H. Nogueira, J. Tirado-Conde, M. C. Looms, M. Kenshlikova, P. Davy, and T. Le Borgne (2023). Advancing measurements and representations of subsurface heterogeneity and dynamic processes: towards 4D hydrogeology. *Hydrology and Earth System Sciences*, 27(1), 255-287, <https://doi.org/10.5194/hess-27-255-2023>
- 109) Winter, C., T. V. Nguyen, A. Musolff, S. R. Lutz, M. Rode, R. Kumar, and **J. H. Fleckenstein** (2023). Droughts can reduce the nitrogen retention capacity of catchments. *Hydrology and Earth System Sciences*, 27(1), 303-318, <https://doi.org/10.5194/hess-27-303-2023>
- 108) Ahmadi, P., H. Elagami, F. Dichgans, C. Schmidt, B. S. Gilfedder, S. Frei, S. Peiffer, and **J. H. Fleckenstein** (2022). Systematic Evaluation of Physical Parameters Affecting the Terminal Settling Velocity of Microplastic Particles in Lakes Using CFD. *Frontiers in Environmental Science*, 10, <https://doi.org/10.3389/fenvs.2022.875220>
- 107) Blaurock, K., P. Garthen, M. P. da Silva, B. Beudert, B. S. Gilfedder, **J. H. Fleckenstein**, S. Peiffer, O. J. Lechtenfeld, and L. Hopp (2022). Riparian Microtopography Affects Event-Driven Stream DOC Concentrations and DOM Quality in a Forested Headwater Catchment. *Journal of Geophysical Research-Biogeosciences*, 127(12), <https://doi.org/10.1029/2022JG006831>
- 106) Elagami, H., P. Ahmadi, **J. H. Fleckenstein**, S. Frei, M. Obst, S. Agarwal, and B. S. Gilfedder (2022). Measurement of microplastic settling velocities and implications for residence times in thermally stratified lakes. *Limnology and Oceanography*, 67(4), 934-945, <https://doi.org/10.1002/lno.12046>
- 105) Jähkel, A., D. Graeber, **J. H. Fleckenstein**, and C. Schmidt (2022). Hydrologic Turnover Matters - Gross Gains and Losses of Six First-Order Streams Across Contrasting Landscapes and Flow Regimes. *Water Resources Research*, 58(7), <https://doi.org/10.1029/2022WR032129>
- 104) Jimenez-Fernandez, O., M. Schwientek, K. Osenbrück, C. Glaser, C. Schmidt, and **J. H. Fleckenstein** (2022). Groundwater-surface water exchange as key control for instream and groundwater nitrate concentrations along a first-order agricultural stream. *Hydrological Processes*, 36(2), <https://doi.org/10.1002/hyp.14507>
- 103) Krause, S., B. W. Abbott, V. Baranov, S. Bernal, P. Blaen, T. Datry, J. Drummond, **J. H. Fleckenstein**, J. G. Velez, D. M. Hannah, J. L. A. Knapp, M. Kurz, J. Lewandowski, E. Martí, C. Mendoza-Lera, A. Milner, A. Packman, G. Pinay, A. S. Ward, and J. P. Zarnetzke (2022).

- Organizational Principles of Hyporheic Exchange Flow and Biogeochemical Cycling in River Networks Across Scales. *Water Resources Research*, 58(3), <https://doi.org/10.1029/2021wr029771>
- 102) Laube, G., C. Schmidt, and **J. H. Fleckenstein** (2022). A systematic model-based evaluation of the influence of hydraulic conductivity, heterogeneity and domain depth on hyporheic nutrient transformation. *Advances in Water Resources*, 159, <https://doi.org/10.1016/j.advwatres.2021.104087>
- 101) Lutz, S. R., P. Ebeling, A. Musolff, T. V. Nguyen, F. J. Sarrazin, K. J. Van Meter, N. B. Basu, **J. H. Fleckenstein**, S. Attinger, and R. Kumar (2022). Pulling the rabbit out of the hat: Unravelling hidden nitrogen legacies in catchment-scale water quality models. *Hydrological Processes*, 36(10), <https://doi.org/10.1002/hyp.14682>
- 100) Nguyen, T. V., R. Kumar, A. Musolff, S. R. Lutz, F. Sarrazin, S. Attinger, and **J. H. Fleckenstein** (2022a). Disparate Seasonal Nitrate Export From Nested Heterogeneous Subcatchments Revealed With StorAge Selection Functions. *Water Resources Research*, 58(3), <https://doi.org/10.1029/2021WR030797>
- 99) Nguyen, T. V., F. J. Sarrazin, P. Ebeling, A. Musolff, **J. H. Fleckenstein**, and R. Kumar (2022b). Toward Understanding of Long-Term Nitrogen Transport and Retention Dynamics Across German Catchments. *Geophysical Research Letters*, 49(24), <https://doi.org/10.1029/2022GL100278>
- 98) Nogueira, G. E. H., C. Schmidt, D. Partington, P. Brunner, and **J. H. Fleckenstein** (2022). Spatiotemporal variations in water sources and mixing spots in a riparian zone. *Hydrology and Earth System Sciences*, 26(7), 1883-1905, <https://doi.org/10.5194/hess-26-1883-2022>
- 97) Schmidtman, J., H. Elagami, B. S. Gilfedder, **J. H. Fleckenstein**, G. Papastavrou, U. Mansfeld, and S. Peiffer (2022). Heteroaggregation of PS microplastic with ferrihydrite leads to rapid removal of microplastic particles from the water column. *Environmental Science-Processes & Impacts*, 24(10), 1782-1789, <https://doi.org/10.1039/d2em00207h>
- 96) Wang, Z., O. Jimenez-Fernandez, K. Osenbrück, M. Schwientek, M. Schlöter, **J. H. Fleckenstein**, and T. Lueders (2022). Streambed microbial communities in the transition zone between groundwater and a first-order stream as impacted by bidirectional water exchange. *Water Research*, 217, <https://doi.org/10.1016/j.watres.2022.118334>
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- 1) **Fleckenstein, J.**, Suzuki, E., Fogg, G. (2001) Options for conjunctive water management to restore fall flows in the Cosumnes River basin, California, *IAHS Red Book*, 272: 175-182

BOOK CHAPTERS

- Krause, S., Abbott, B.W., Baranov, V., Bernal, S., Blaen, P., Datry, T., Drummond, J., **Fleckenstein, J.H.**, Gomez Velez, J., Hannah, D.M., Knapp, J.L.A., Kurz, M., Lewandowski, J., Martí, E., Mendoza-Lera, C., Milner, A., Packman, A., Pinay, G., Ward, A.S., Zarnetzke, J.P. (2024) Organizational principles of hyporheic exchange flow and biogeochemical cycling in river networks across scales, in: Krause, S., Hannah, D.M., Grimm, N.B. (eds.): *Ecohydrological interfaces*, Wiley, Hoboken, NJ, p. 63 – 101
- Krause, S., Lewandowski, J., Grimm, N.B., Hannah, D.M., Pinay, G., McDonald, K., Martí, E., Argerich, A., Pfister, L., Klaus, J., Battin, T., Larned, S.T., Schelker, J., **Fleckenstein, J.H.**, Schmidt, C., Rivett, M.O., Watts, G., Sabater, F., Sorolla, A., Turk, V. (2024) Ecohydrological interfaces as hotspots of ecosystem processes, in: Krause, S., Hannah, D.M., Grimm, N.B. (eds.): *Ecohydrological interfaces*, Wiley, Hoboken, NJ, p. 1 – 28
- Schmidt, C. and **Fleckenstein, J.H.** (2024) Identifying and quantifying water fluxes at ecohydrological interfaces, in: Krause, S., Hannah, D.M., Grimm, N.B. (eds.): *Ecohydrological interfaces*, Wiley, Hoboken, NJ, p. 149 - 165
- Mutz, M. Schmidt C., **Fleckenstein, J.H.** (2015) Hydromorphologie des hyporheischen Interstitials (hydromorphology of the hyporheic interstitial, in German), in: Brendelberger H., Martin, P., Brunke, M., Hahn, H.J. (eds.): Grundwassergeprägte Lebensräume - Eine Übersicht über Grundwasser, Quellen, das hyporheische Interstitial und weitere Habitate, *Limnologie Aktuell*, Bd. 14, E. Schweizerbart'sche Verlagsbuchhandlung, Stuttgart, 2015

KEYNOTES AND SELECTED INVITED PRESENTATIONS

- Fleckenstein J.H.** (invited) Groundwater – surface water interactions revisited, eLTER Science Conference 2025, June 26th, 2025
- Fleckenstein J.H.** (invited) Microplastic Transport in the Hyporheic Zone A Combined Modeling and Experimental Study, TU Berlin, *Colloquium Hydrosociences* (Prof. R. Hinkelmann), February 8, 2024
- Fleckenstein J.H.** (invited) Simulating hyporheic exchange and reactions to evaluate nitrate attenuation in streams, *World Water Day Colloquium*, University of Hohenheim, March 22, 2022
- Fleckenstein J.H.** (invited) Using models to better understand the dynamics of groundwater-surface water interactions, TU München, Lehrstuhl für Hydrologie und Flussgebietsmanagement (Prof. Disse), Seminar, Munich, July 1, 2019
- Fleckenstein J.H.** (invited) Understanding catchment solute dynamics – combining top-down and bottom-up analyses, BOKU and TU Vienna joint Seminar on Water Resources, Vienna, January 17, 2017
- Fleckenstein J.H.** (invited) Surface and Subsurface Waters: Identifying Interactions and Their Importance for Catchment Solute Dynamics, Gordon Research Conference, Catchment Science: Interactions of Hydrology, Biology & Geochemistry, Andover NH, June 14-19, 2015
- Fleckenstein, J.H.**, Trauth N., Maier U., Schmidt C. (keynote) Combining high frequency monitoring and numerical modelling to unravel DOC export dynamics in small-catchments, HydroEco 2015, Vienna, May 13-16, 2015

- Fleckenstein J.H.** (invited) Die Grenzzone zwischen Grund-(GW) und Oberflächenwasser (OW) als Mediator für Wasser und Stoffflüsse, Annual Meeting of the German Association for Limnology (Deutsche Gesellschaft für Limnologie – DGL), Magdeburg, September 29-October 2, 2014
- Fleckenstein, J.H., Trauth N., Maier U., Schmidt C.** (keynote) Exploring hyporheic exchange, residence times & implications for matter turnover at the GW-SW interface, HydroEco 2013, Rennes, May 13-16, 2013
- Fleckenstein J.H.** (invited) Export of dissolved organic carbon (DOC) from catchments – what can we learn from improved online monitoring, Zentrum für Angewandte Geowissenschaften - ZAG, Universität Tübingen, May 3, 2013
- Fleckenstein J.H.** (invited) Numerische Simulation als Werkzeug zur Beschreibung von Grundwasser-Oberflächenwasser Interaktionen, Institut für Geophysik und Geologie, Universität Leipzig, January 24, 2013
- Fleckenstein J.H.** (invited) Methoden und Verfahren zur Beschreibung von Grundwasser-Oberflächenwasser Interaktionen, Institut für Grundwasserwirtschaft, Technische Universität Dresden, January 26, 2012
- Fleckenstein J.H., Frei S., Bartsch S.** (invited) Fully integrated simulation of coupled surface-subsurface hydrologic systems using HydroGeoSphere, Leibniz-Zentrum für Agrarlandschaftsforschung (ZALF) e.v., Müncheberg, February 23, 2012
- Fleckenstein J.H., Angermann L. Niswonger R.** (invited) Controls of Groundwater-Surface Water Exchange at nested Scales – What matters where and when?, Meeting of the Geological Society of America (GSA), Minneapolis, October 9-12, 2011
- Fleckenstein J.H., Frei S., Schmidt C., Bartsch S.** (invited) Complex linkages between hydrologic dynamics and biogeochemical processes in the near stream zone – new ways forward, HydroEco 2011, Vienna, May 2-5, 2011
- Fleckenstein J.H.** (keynote) Muster und Dynamik von Grundwasser-Oberflächenwasser-Interaktionen - neue Herausforderungen an Charakterisierung und Simulation, FH-DGG Conference (Hydrogeology Section within the German Geologic Society), Tübingen, May 12-15, 2010
- Fleckenstein J.H., Niswonger R.** (invited) Simulating space and time patterns of river-aquifer exchange – the missing scale, AGU Fall Meeting, San Francisco, December 14-18, 2009
- Fleckenstein J.H. and Frei S.** (invited) Effects of micro-topography on runoff generation and residence times in a riparian wetland, Research Seminar Series, US Geological Survey, Menlo Park, Water Resources Division, September 11, 2009
- Fleckenstein J.H., Frei S. and Niswonger R.G.** (invited) Simulating river-aquifer exchange – the missing scale, Hyporheic Hydrology, National Meeting of the British Hydrological Society (BHS), University of Birmingham, December 17, 2008
- Fleckenstein J.H.** (keynote) Dynamics and patterns of river-aquifer exchange, What kind of predictions do we need?, HydroPredict 2008, Prague, September 15-19, 2008
- Fleckenstein J.H.** (invited) Dynamics and patterns of groundwater-surface water exchange, measurements and simulation, ETH, Zürich, June 5, 2008
- Fleckenstein J.H.** (invited) Effects of geologic heterogeneity in river-aquifer systems with variably saturated flow, Helmholtz Center for Environmental Research – UFZ, Department of Hydrogeology, Leipzig, August 27, 2007
- Fleckenstein J.H., Niswonger, R., Fogg, G.E.** (invited) Simulation of geologic heterogeneity and river aquifer interactions in an alluvial fan system, Cosumnes River California, Lawrence Livermore National Laboratory (LLNB), December 2005
- Fleckenstein J.H., Niswonger, R. and Fogg G.E.** (invited) River-aquifer exchange, minimum flows and salmon spawning - The case of the Cosumnes River, Research seminar of the Groundwater Resources Association (GRA) of Sacramento, California, June 2004

TEACHING EXPERIENCECOURSES TAUGHT WITHIN THE UFZ GRADUATE SCHOOL HIGRADE

- 2016 **Transition probability based geostatistical indicator simulation** (introductory level lecture for PhD-students, as part of a three-day course on “Geostatistics”)
- 2011-2013 **Introduction to hydrology and hydrologic modeling** (introductory level lecture for PhD-students)
- 2014 **Water and matter flux dynamics in catchments** (lecture for PhD-students on research within the Integrated Project “Water and Matter Flux Dynamics in Catchments”)

COURSES TAUGHT AT THE UNIVERSITY OF BAYREUTH

- 2004 – 2008 **Introduction to Statistics** (lecture & exercises, undergraduate level)
- Data types, descriptive statistics
 - Basic probability, distributions, central limit theorem
 - statistical testing
 - correlation and regression analysis
 - error propagation
- 2005 – 2009 **Hydrologic and Soil-Physical Field Course** (data acquisition and analysis)
- Installation and operation of field instrumentation (tensiometers, TDR, lysimeters, rain gauges, pressure transducers in wells etc.)
 - Estimation of ET from an ET-lysimeter
 - Estimation of infiltration using infiltrometers
 - Methods for stream gauging (flow-meter, weirs, dilution, salt tracer)
 - Assessment of groundwater-surface water interactions
- 2004 – 2010 **Introduction to Hydrology** (tutorial & exercises, undergraduate level)
- Water balance of a small catchment
 - Hydrograph separation, baseflow recession
 - Estimation of groundwater flow direction and hydraulic conductivity
 - Groundwater flow equations and hydraulics
 - Groundwater flow nets
 - Infiltration and water in soils
- 2004 – 2006 **Principles of Physical Geography – Focus: Water** (seminar, undergraduate level)
- Selected topics on water (e.g. hydrologic cycle, flooding and droughts, river flow regimes), student presentations
- 2006 – 2010 **Hydrologic Simulation** (seminar, computer labs with assignments, graduate level)
- Concepts and model types
 - Mathematical descriptions of hydrologic processes, main flow equations
 - Solution algorithms and methods (e.g. FD, FE)
 - Parameterization and calibration
 - Model and parameter uncertainties, scale issues
 - Simulation of transport in groundwater
 - Simulation of variably saturated flow and heat transport
 - Rainfall-runoff modeling
- 2006 **Project Seminar “Hydrology”** (seminar, field project and lab work, graduate level)
- Subsurface flow and transport (well-to-well tracer test, field-to-stream tracer test, analysis of breakthrough curves, pump tests, analysis of lysimeter data)

Since 2017, Professorship for “Hydrologic Modelling”

- 2017 to present **Simulation of water and solute dynamics in catchments** (seminar, computer labs with assignments, advanced bachelor and master level)
- Hydrologic and biogeochemical processes in catchments
 - Concentration-discharge relationships and export regimes
 - Main equations of groundwater flow and transport
 - Simulation of pollutant transport in groundwater (assignment)
 - Simulation of solute export from catchments (assignment)
 - Data-driven analysis of export regimes (assignment)
- 2018 **Project Seminar “Hydrology & Hydrogeology”** (seminar, field project and lab work, master level)
- Groundwater (GW) monitoring (quantity & quality), slug and pump tests
 - Radon as a natural tracer for groundwater inflows into streams
 - Hydrologic & meteorological measurements (stream flow, rainfall, ET)
 - Instream salt tracer tests to quantify GW-surface water exchange
- 2019 **Basic equations in Environmental Physics** (joint seminar together with other faculty on key topics and equations in Environmental Physics, master level)
- Basic equations for subsurface flow and transport
 - Equations for the simulation of dissolved organic carbon (DOC) export from catchments and riparian zones (transmissivity feedback, riparian integration model)
- 2020 to present **Physical field methods – Hydrogeology** (as part of a large multi-disciplinary field course, including methods from hydrology, hydrogeology, soil physics and micro-meteorology)
- Synoptic and automated groundwater monitoring
 - Aquifer parameter estimation using Slug Tests
 - Estimation of groundwater recharge
 - Water balance of a small catchment

TRAINING IN DIDACTICS

I completed two training courses that are part of an education program by the Center for University Didactics (Fortbildungszentrum Hochschulehre - FBZHL), which is jointly operated by the Universities of Bamberg, Bayreuth, Erlangen-Nürnberg and Würzburg:

- Self-Management: 2 day seminar: “Neu in der Dozentenrolle – Selbstmanagement für wissenschaftliche Mitarbeiter”, October 2004
- Teaching: 2 day seminar: “Teaching informative and interactive courses”, May 2010

STUDENT MENTORING AND ADVISING

Supervised PhD Theses (in order from most recent to past)

- 11) Shabiha Sultana Rimi (since 2023): Transport and Fate of Microplastics in Fluvial Systems (SFB 1357, University of Bayreuth)
- 10) Pouyan Ahmadi (2024): Transport and behaviour of microplastic in standing waters and lakes (SFB 1357, University of Bayreuth)
- 9) Gerrit Laube (2024): Impact of streambed heterogeneity and groundwater interactions on hyporheic flux and turnover, (Technical University of Dresden)
- 8) Carolin Winter (2023): Understanding nutrient transport and storage across spatio-temporal scales, (University of Bayreuth)

- 7) Franz Dichgans (since 2019): Transport and fate of microplastic in streams and the hyporheic zone, (SFB 1357, University of Bayreuth)
- 6) Benedikt Werner (2023): A complexity-reduced, mechanistic model for DOC export from catchments, (University of Bayreuth)
- 5) Guilherme Nogueira (2022): Space and time patterns of oxygen and nitrate turnover in a riparian aquifer
- 4) Óscar Jiménez Fernández (since 2017): Dynamics of flow, solute flux and turnover in the stream-groundwater transition zone (SFB 1253, University of Tübingen)
- 3) Nico Trauth (2015): Flow and reactive transport modeling at the stream-groundwater interface. Effects of hydrological conditions and streambed morphology, (University of Potsdam)
- 2) Sven Frei (2013): Riparian wetlands: hydrology meets biogeochemistry - Interactions between hydrology and biogeochemistry within riparian wetlands, (University of Bayreuth)
- 1) Svenja Bartsch (2013): Dynamics of Nitrate and DOC in an agricultural watershed with monsoonal climate, Haean Catchment, South Korea, (University of Bayreuth)

Co-supervised PhD Theses (in order from most recent to past)

- 8) Arianna Borriero (2024): Tracer-aided modelling of flow, solute transport and reactivity in response to dynamic hydrological conditions, main supervisor: Dr. Stefanie Lutz, UFZ-Leipzig, now at University of Utrecht
- 7) Pia Ebeling (2023): A nation-wide assessment of surface water quality dynamics using concentration-discharge relationships, main supervisor: Dr. Andreas Musolff, UFZ-Leipzig
- 6) Sophie Ehrhardt (2021): Water travel times as a tool to model catchment nitrogen export at the mesoscale, main supervisor: Dr. Andreas Musolff, UFZ-Leipzig
- 5) Weishi Wang (2020): Simulating the effects of channel dredging on groundwater flow dynamics at a bank filtration site, main supervisor: Prof. Sascha Oswald, University of Potsdam
- 4) Wenkui He (2017): Simulation of reactive transport in a fully integrated surface-subsurface numerical flow model, main supervisor: Prof. Olaf Kolditz, TU Dresden
- 3) Tanja Brand (since 2013): Improved optode-based oxygen sensing at complex ecohydrological interfaces, main supervisor: Dr. Christian Schmidt, UFZ-Leipzig
- 2) Michael Vieweg (since 2010): A robust optode-based method for measuring in situ oxygen profiles in the hyporheic zone – development, testing and applications, main supervisor: Dr. Christian Schmidt, UFZ-Leipzig
- 1) Christian Anibas (2012): Quantifying groundwater-surface water interaction by using heat as a natural tracer, main supervisor: Prof. Okke Batelaan, Vrije Universiteit Brussel

Supervised Diplom and Master Theses (in order from most recent to past)

- 14) Laurin Klostermann (2026): Assessing groundwater drought recovery in Germany
- 13) Lisa Jagau (2023): Three-Dimensional Hydrodynamic Modeling of Microplastic Transport in Limnic Systems
- 12) Ines Aumüller (2021): *In-situ* Aufbereitung eisen- und manganhaltiger Grundwässer zur geothermischen Nutzung, in Kooperation mit dem Ingenieurbüro TEWAG, Regensburg
- 11) Linus Schauer (2021): Modeling stream flow and dissolved organic carbon export from a small catchment in the Harz Mountains
- 10) Philip Auernheimer (2020): Simulation von Radon und Grundwasser-Oberflächenwasser-Austauschdynamik in einem kleinen landwirtschaftlichen Einzugsgebiet, co-supervised with Dr. habil. Sven Frei, University of Bayreuth
- 9) Sebastian Rudnick (2011): Charakterisierung der Oberflächenwasser-Grundwasser Wechselwirkungen zweier eutropher Flachseen in Brandenburg, co-supervised with Prof. Gunnar Nützmann, IGB-Berlin
- 8) Christina Schornberg (2010): Simulating the effects of geologic heterogeneity and transient boundary conditions on streambed temperatures – Implications for temperature-based water flux calculations

- 7) Lisa Angermann (2010): Determination of small scale flow direction and velocity in the hyporheic interstitial, co-supervised with Dr. Jörg Lewandowski, IGB-Berlin
- 6) Sandra Werb (2009): Simulation der hydrologischen Dynamik im Einzugsgebiet des Lehstenbachs mit dem physikalisch begründeten Modell HydroGeoSphere
- 5) Benjamin Kopp (2009): Effects of long-term drainage on hydrogeological and biogeochemical processes in a Canadian peatland, co-supervised with Prof. C. Blodau, University of Münster
- 4) Sabine Karl (2009): Modellgestützte Bewertung der Auswirkungen von Landnutzungsänderungen auf den Gebietswasserhaushalt, Gemeinde Hinterzarten.
- 3) Sven Frei (2008): Using a parallel surface-subsurface flow model to assess the effects of geologic heterogeneity on river-aquifer-exchange
- 2) Nina Volze (2008): Quantification of lake-ground water exchange rates in a post mining lake
- 1) Felix Möhler (2008): Modellierung des Oberflächenwasser-Grundwasser-Austausches in einem Niedermoor

Supervised Bachelor Theses (in order from most recent to past)

- 4) Axel Müller (2011): Vergleich von Abflussmessungen unter monsunalen Bedingungen in einem kleinen Einzugsgebiet in Südkorea
- 3) Sebastian Würzer (2009): Charakterisierung der Anbindung eines Baches an ein Niedermoor (Schlößpnerbrunnen) im Wassereinzugsgebiet des Lehstenbachs
- 2) Nena Griebinger (2009): Hysterese der Schneehöhenvariabilität im Schweizer Alpenraum
- 1) Eva Obermaier (2008): Charakterisierung des Fluss-Grundwasseraustausches an einem Abschnitt des Roten Mains

Leipzig, 03.09.2026