



Publications

Helmholtz Centre for Environmental Research – UFZ

Topic 4: Coastal Transition Zones under Natural and Human Pressure

Preface

This list includes all publications of the year 2024 assigned to program topic 4 “Coastal Transition Zones under Natural and Human Pressure” of the Helmholtz research program "Changing Earth - Sustaining our Future" within the research field Earth and Environment which were authored, co-authored or edited by staff members of the Helmholtz Centre for Environmental Research - UFZ.

If a publication belongs to more than one program topic, both primary and secondary assignments are indicated.

The editorial deadline for this publication list was 28 February 2025.

In contrast to external authors, UFZ staff names are highlighted in **bold type** in all publications.

The concluding index lists all UFZ authors in alphabetical order with the sequential numbers of their publications.

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Publications in ISI/Scopus listed journals/series

1. **Abbas, G., Jomaa, S., Fink, P., Brosinsky, A., Nowak, K.M., Kümmel, S., Schkade, U.-K., Rode, M.** (2024):
Investigating sediment sources using compound-specific stable isotopes and conventional fingerprinting methods in an agricultural loess catchment
Catena **246**, art. 108336 [10.1016/j.catena.2024.108336](https://doi.org/10.1016/j.catena.2024.108336)
Main topic T5; Secondary topics T7, T4
2. **Borriero, A., Musolff, A., Kumar, R., Fleckenstein, J.H., Lutz, S.R., Nguyen, V.T.** (2024):
The value of instream stable water isotope and nitrate concentration data for calibrating a travel time-based water quality model
Hydrol. Process. **38** (5), e15154 [10.1002/hyp.15154](https://doi.org/10.1002/hyp.15154)
Main topic T5; Secondary topic T4
3. **Borriero, A., Nguyen, V.T., Lutz, S.R., Fleckenstein, J.H., Musolff, A., Kumar, R.** (2024):
Can the young water fraction reduce predictive uncertainty in water transit time estimations?
J. Hydrol. **645, Part B**, art. 132238 [10.1016/j.jhydrol.2024.132238](https://doi.org/10.1016/j.jhydrol.2024.132238)
Main topic T5; Secondary topic T4
4. Boumaiza, L., Stotler, R.L., Mayer, B., Matiatos, I., Sacchi, E., Otero, N., Johannesson, K.H., Huneau, F., Chesnaux, R., Blarasin, M., Re, V., **Knöller, K.** (2024):
How the $\delta^{18}\text{O}_{\text{NO}_3}$ versus $\delta^{15}\text{N}_{\text{NO}_3}$ plot can be used to identify a typical expected isotopic range of denitrification for NO_3 -impacted groundwaters
ACS ES&T Wat. **4** (12), 5243 - 5254 [10.1021/acsestwater.4c00796](https://doi.org/10.1021/acsestwater.4c00796)
Main topic T5; Secondary topic T4
5. Bouwman, A.F., **Bärlund, I.**, Beusen, A.H.W., Flörke, M., Gramberger, M., Rivera Cardona, J., Podgorski, J., van den Roovaart, J., Grizzetti, B., Janssen, A.B.G., **Kumar, R.**, Langan, S., Poikane, S., Spears, B.M., Stokal, M., Tang, T., Troost, T.A., Vigiak, O., van Vliet, M.T.H., Vystavna, Y., Wang, M., Hofstra, N. (2024):
Multimodel and multiconstituent scenario construction for future water quality
Environ. Sci. Technol. Lett. **11** (12), 1272 - 1280 [10.1021/acs.estlett.4c00789](https://doi.org/10.1021/acs.estlett.4c00789)
Main topic T5; Secondary topic T4
6. **Chávez García Silva, R.**, Reinecke, R., Coptý, N.K., Barry, D.A., Heggy, E., Labat, D., Roggero, P.P., **Borchardt, D., Rode, M.**, Gómez-Hernández, J.J., **Jomaa, S.** (2024):
Multi-decadal groundwater observations reveal surprisingly stable levels in southwestern Europe
Commun. Earth Environ. **5**, art. 387 [10.1038/s43247-024-01554-w](https://doi.org/10.1038/s43247-024-01554-w)
Main topic T5; Secondary topic T4

7. **Chen, M., Jomaa, S., Lausch, A.,** Beudert, B., **Ghaffar, S.,** Jia, W., **Rode, M.** (2024):
Impact of forest dieback on hydrology and nitrogen export using a new dynamic water quality model
Water Resour. Res. **60** (11), e2024WR037341 [10.1029/2024wr037341](https://doi.org/10.1029/2024wr037341)
Main topic T5; Secondary topic T4

8. Crayol, E., Huneau, F., Garel, E., Zuffianò, L.E., Limoni, P.P., Romanazzi, A., Mattei, A., Re, V., **Knoeller, K.,** Polemio, M. (2024):
Investigating pollution input to coastal groundwater-dependent ecosystems in dry Mediterranean agricultural regions
Sci. Total Environ. **954** , art. 176015 [10.1016/j.scitotenv.2024.176015](https://doi.org/10.1016/j.scitotenv.2024.176015)
Main topic T4; Secondary topic T5

9. **Escher, B.I., Ahlheim, J., Böhme, A., Borchardt, D., Brack, W., Braun, G.,** Colbourne, J.K., **Dann, J.P.,** Gessner, J., **Jahnke, A., König, M., Klüver, N., Krauss, M., Lee, J.,** Li, X., **Lips, S.,** Orsini, L., **Rinke, K., Schmitt-Jansen, M., Scholz, S., Schulze, T.,** Spahr, S., **Ulrich, N., Weitere, M.,** Varga, E. (2024):
Mixtures of organic micropollutants exacerbated in vitro neurotoxicity of prymnesins and contributed to aquatic toxicity during a toxic algal bloom
Nat. Water **2** (9), 889 - 898 [10.1038/s44221-024-00297-4](https://doi.org/10.1038/s44221-024-00297-4)
Main topic T9; Secondary topics T5, T4

10. **Finckh, S., Carmona, E., Borchardt, D., Büttner, O., Krauss, M., Schulze, T., Yang, S., Brack, W.** (2024):
Mapping chemical footprints of organic micropollutants in European streams
Environ. Int. **183** , art. 108371 [10.1016/j.envint.2023.108371](https://doi.org/10.1016/j.envint.2023.108371)
Main topic T9; Secondary topics T5, T4

11. **Ghaffar, S., Zhou, X., Jomaa, S., Yang, X.,** Meon, G., **Rode, M.** (2024):
Toward a data-effective calibration of a fully distributed catchment water quality model
Water Resour. Res. **60** (9), e2023WR036527 [10.1029/2023wr036527](https://doi.org/10.1029/2023wr036527)
Main topic T5; Secondary topic T4

12. **Graeber, D.,** McCarthy, M.J., **Shatwell, T., Borchardt, D.,** Jeppesen, E., Søndergaard, M., Lauridsen, T.L., Davidson, T.A. (2024):
Consistent stoichiometric long-term relationships between nutrients and chlorophyll-a across shallow lakes
Nat. Commun. **15** , art. 809 [10.1038/s41467-024-45115-3](https://doi.org/10.1038/s41467-024-45115-3)
Main topic T5; Secondary topic T4

13. Haro, S., Bermejo, R., Healy, M.G., **Knöller, K.**, Fenton, O., Heesch, S., Morrison, L. (2024):
Seasonal variability of golden tides (*Pylaiella littoralis*, Phaeophyceae) and nutrient dynamics in a potentially eutrophic intertidal estuary
J. Mar. Sci. Eng. **12** (12), art. 2336 [10.3390/jmse12122336](https://doi.org/10.3390/jmse12122336)
Main topic T4; Secondary topic T5

14. **Hildebrandt, S.**, Krueger, E.H., Ruhl, A.S., **Borchardt, D.** (2024):
Efficacy of point source legislation quantified for a 64-year river water quality trajectory of phosphorus loading
J. Environ. Manage. **352**, art. 119956 [10.1016/j.jenvman.2023.119956](https://doi.org/10.1016/j.jenvman.2023.119956)
Main topic T5; Secondary topic T4

15. Horovitz, M., Muñoz-Vega, E., **Knöller, K.**, Leitão, T.E., Schüth, C., Schulz, S. (2024):
Infiltration of secondary treated wastewater into an oxic aquifer: Hydrochemical insights from a large-scale sand tank experiment
Water Res. **267**, art. 122542 [10.1016/j.watres.2024.122542](https://doi.org/10.1016/j.watres.2024.122542)
Main topic T4; Secondary topic T5

16. **Hromova, Y.**, Brauns, M., **Kamjunke, N.** (2024):
Lagrangian dynamics of the spring zooplankton community in a large river
Hydrobiologia **851**, 3603 - 3621 [10.1007/s10750-024-05520-7](https://doi.org/10.1007/s10750-024-05520-7)
Main topic T5; Secondary topic T4

17. **Kamjunke, N.**, Herzsprung, P., von Tümpling, W., Lechtenfeld, O.J. (2024):
Photochemical and microbial degradation of deadwood leachate
J. Geophys. Res.-Biogeosci. **129** (12), e2024JG008184 [10.1029/2024jg008184](https://doi.org/10.1029/2024jg008184)
Main topic T5; Secondary topics T9, T4

18. **Kamjunke, N.**, Sanders, T. (2024):
Complete exhaustion of dissolved nutrients in a large lowland river
Environ. Monit. Assess. **196** (7), art. 660 [10.1007/s10661-024-12834-5](https://doi.org/10.1007/s10661-024-12834-5)
Main topic T5; Secondary topic T4

19. Knapp, J.L.A., **Musolff, A.** (2024):
Concentration-discharge relationships revisited: overused but underutilised?
Hydrol. Process. **38** (11), e15328 [10.1002/hyp.15328](https://doi.org/10.1002/hyp.15328)
Main topic T5; Secondary topic T4

20. **Koschorreck, M.**, **Kamjunke, N.**, Koedel, U., Rode, M., Schuetze, C., Bussmann, I. (2024):
Diurnal versus spatial variability of greenhouse gas emissions from an anthropogenically modified lowland river in Germany
Biogeosciences **21** (6), 1613 - 1628 [10.5194/bg-21-1613-2024](https://doi.org/10.5194/bg-21-1613-2024)
Main topic T5; Secondary topic T4

21. Manfreda, S., Miglino, D., Saddi, K.C., **Jomaa, S.**, Eltner, A., Perks, M., Peña-Haro, S., Bogaard, T., van Emmerik, T.H.M., Mariani, S., Maddock, I., Tauro, F., Grimaldi, S., Zeng, Y., Gonçalves, G., Strelnikova, D., Bussetini, M., Marchetti, G., Lastoria, B., Su, Z., **Rode, M.** (2024):
Advancing river monitoring using image-based techniques: challenges and opportunities
Hydrol. Sci. J.-J. Sci. Hydrol. **69** (6), 657 - 677 [10.1080/02626667.2024.2333846](https://doi.org/10.1080/02626667.2024.2333846)
Main topic T5; Secondary topic T4

22. **Meyer, M., Koschorreck, M., Weitere, M.,** Kneis, D., **Perujo, N.** (2024):
Dissolved organic matter quality, hydrological connectivity and microbial activity shape phosphorus buffering in river-floodplain systems
Sci. Total Environ. **957**, art. 177452 [10.1016/j.scitotenv.2024.177452](https://doi.org/10.1016/j.scitotenv.2024.177452)
Main topic T5; Secondary topic T4

23. **Musolff, A., Tarasova, L., Rinke, K., Ledesma, J.L.J.** (2024):
Forest dieback alters nutrient pathways in a temperate headwater catchment
Hydrol. Process. **38** (10), e15308 [10.1002/hyp.15308](https://doi.org/10.1002/hyp.15308)
Main topic T5; Secondary topic T4

24. **Nakulopa, F., Bärlund, I., Borchardt, D.** (2024):
How a reservoir modulates downstream water quality under declining upstream loading and progressing climate change
Sci. Total Environ. **912**, art. 169460 [10.1016/j.scitotenv.2023.169460](https://doi.org/10.1016/j.scitotenv.2023.169460)
Main topic T5; Secondary topic T4

25. Oprei, A., Schreckinger, J., **Kamjunke, N., Worrich, A.,** Mutz, M., **Risse-Buhl, U.** (2024):
Migrating ripples create streambed heterogeneity altering microbial diversity and metabolic activity
Limnol. Oceanogr. **69** (8), 1882 - 1899 [10.1002/lno.12631](https://doi.org/10.1002/lno.12631)
Main topic T4; Secondary topics T7, T5

26. Perović, M., Obradović, V., Zuber-Radenković, V., **Knoeller, K.,** Mitrović, D., Čepić, Z. (2024):
The comprehensive evaluation of nitrate origin and transformation pathways in the oxic alluvial aquifer in Serbia
Environ. Sci. Pollut. Res. **31** (22), 33030 - 33046 [10.1007/s11356-024-33403-w](https://doi.org/10.1007/s11356-024-33403-w)
Main topic T4; Secondary topic T5

27. Perović, M., Obradović, V., Zuber-Radenković, V., Mitrović, D., **Knoeller, K.,** Turk Sekulić, M. (2024):
Integrated analysis of ammonium origins in a Serbian anoxic alluvial aquifer: Insight from physicochemical, isotopic, microbiological data
Appl. Geochem. **171**, art. 106103 [10.1016/j.apgeochem.2024.106103](https://doi.org/10.1016/j.apgeochem.2024.106103)
Main topic T4; Secondary topic T5

28. Richard-Cerda, J.C., Bockstiegel, M., Muñoz-Vega, E., **Knöller, K.**, Schüth, C., Schulz, S. (2024):
High-resolution monitoring and redox-potential-based solute transport modeling to partition denitrification pathways at an agricultural site
ACS ES&T Wat. **4** (11), 4917 - 4931 [10.1021/acsestwater.4c00540](https://doi.org/10.1021/acsestwater.4c00540)
Main topic T5; Secondary topic T4

29. **Rocha Vogel, A., Kolberg, Y., Schmidt, M., Kahlert, H., von Tümpling, W.** (2024):
Potential deterioration of chemical water quality due to trace metal adsorption onto tire and road wear particles -Environmentally representative experiments
Environ. Pollut. **359**, art. 124571 [10.1016/j.envpol.2024.124571](https://doi.org/10.1016/j.envpol.2024.124571)
Main topic T5; Secondary topics T7, T4

30. **Saavedra, F., Musolff, A., von Freyberg, J., Merz, R., Knöller, K., Müller, C., Brunner, M., Tarasova, L.** (2024):
Winter post-droughts amplify extreme nitrate concentrations in German rivers
Environ. Res. Lett. **19** (2), art. 024007 [10.1088/1748-9326/ad19ed](https://doi.org/10.1088/1748-9326/ad19ed)
Main topic T5; Secondary topic T4

31. **Schmidt, S.I., Schröder, T., Kutzner, R.D., Laue, P., Bernert, H., Stelzer, K., Friese, K., Rinke, K.** (2024):
Evaluating satellite-based water quality sensing of inland waters on basis of 100+ German water bodies using 2 different processing chains
Remote Sens. **16**, art. 3416 [10.3390/rs16183416](https://doi.org/10.3390/rs16183416)
Main topic T5; Secondary topic T4

32. **Schröder, T., Schmidt, S.I., Kutzner, R.D., Bernert, H., Stelzer, K., Friese, K., Rinke, K.** (2024):
Exploring spatial aggregations and temporal windows for water quality match-up analysis using Sentinel-2 MSI and Sentinel-3 OLCI data
Remote Sens. **16** (15), art. 2798 [10.3390/rs16152798](https://doi.org/10.3390/rs16152798)
Main topic T5; Secondary topic T4

33. **Schubert, M., Kopitz, J., Taeglich, S., Lucks, C., Knoeller, K.** (2024):
Radio-sulphur as groundwater residence time tracer – Adapting the ³⁵S extraction approach for water samples rich in sulphate
J. Environ. Radioact. **280**, art. 107553 [10.1016/j.jenvrad.2024.107553](https://doi.org/10.1016/j.jenvrad.2024.107553)
Main topic T5; Secondary topic T4

34. **Shikhani, M., Reinschke, L., Aurich, P., Waldemer, C., Koschorreck, M., Bohrer, B.** (2024):
Composition of photosynthetic gas bubbles from submerged macrophytes
Water Resour. Res. **60** (1), e2022WR034010 [10.1029/2022WR034010](https://doi.org/10.1029/2022WR034010)
Main topic T5; Secondary topic T4

35. **Wachholz, A.,** Jawitz, J.W., **Borchardt, D.** (2024):
From Iron Curtain to green belt: shift from heterotrophic to autotrophic nitrogen retention in the Elbe River over 35 years of passive restoration
Biogeosciences **21** (15), 3537 - 3550 [10.5194/bg-21-3537-2024](https://doi.org/10.5194/bg-21-3537-2024)
Main topic T4; Secondary topic T5

36. **Waldemer, C., Lechtenfeld, O.J., Gao, S., Koschorreck, M., Herzsprung, P.** (2024):
Anaerobic degradation of excess protein-rich fish feed drives CH₄ ebullition in a freshwater aquaculture pond
Sci. Total Environ. **954**, art. 176514 [10.1016/j.scitotenv.2024.176514](https://doi.org/10.1016/j.scitotenv.2024.176514)
Main topic T9; Secondary topics T5, T4

37. **Waldemer, C.,** Schwarz, M., Lorke, A., **Boehrer, B., Koschorreck, M.** (2024):
Bubble sizes inferred from bubble gas composition in a temperate freshwater fish pond
Inland Waters **14** (1-2), 1 - 14 [10.1080/20442041.2024.2327974](https://doi.org/10.1080/20442041.2024.2327974)
Main topic T5; Secondary topic T4

38. **Winter, C.,** Jawitz, J.W., **Ebeling, P.,** Cohen, M.J., **Musolff, A.** (2024):
Divergence between long-term and event-scale nitrate export patterns
Geophys. Res. Lett. **51** (10), e2024GL108437 [10.1029/2024GL108437](https://doi.org/10.1029/2024GL108437)
Main topic T5; Secondary topic T4

39. Yang, X., Tetzlaff, D., Jin, J., Li, Q., **Borchardt, D.,** Soulsby, C. (2024):
Linking terrestrial biogeochemical processes and water ages to catchment water quality: A new Damköhler analysis based on coupled modeling of isotope tracers and nitrate dynamics
Water Res. **262**, art. 122118 [10.1016/j.watres.2024.122118](https://doi.org/10.1016/j.watres.2024.122118)
Main topic T5; Secondary topic T4

40. **Zacharias, S.,** Loescher, H.W., Bogena, H., Kiese, R., **Schrön, M., Attinger, S.,** Blume, T., **Borchardt, D.,** Borg, E., **Bumberger, J.,** Chwala, C., **Dietrich, P.,** Fersch, B., **Frenzel, M.,** Gaillardet, J., Groh, J., Hajnsek, I., Itzerott, S., Kunkel, R., Kunstmann, H., Kunz, M., Liebner, S., **Mirtl, M.,** Montzka, C., **Musolff, A.,** Pütz, T., **Rebmann, C., Rinke, K., Rode, M.,** Sachs, T., **Samaniego, L.,** Schmid, H.P., **Vogel, H.-J.,** Weber, U., **Wollschläger, U.,** Vereecken, H. (2024):
Fifteen years of integrated Terrestrial Environmental Observatories (TERENO) in Germany: Functions, services and lessons learned
Earth Future **12** (6), e2024EF004510 [10.1029/2024ef004510](https://doi.org/10.1029/2024ef004510)
Main topic T5; Secondary topic T4

41. Zaryab, A., Alijani, F., **Knoeller, K.,** Minet, E., Musavi, S.F., Ostadhashemi, Z. (2024):
Identification of groundwater nitrate sources in an urban aquifer (Alborz Province, Iran) using a multi-parameter approach
Environ. Geochem. Health **46** (3), art. 100 [10.1007/s10653-024-01872-0](https://doi.org/10.1007/s10653-024-01872-0)
Main topic T5; Secondary topic T4

Publications in other journals

42. **Rocha Vogel, A., Reisch, M., von Tümpling, W.** (2024):
Gewinnung von Reifenabrieb aus Umweltproben durch Dichteabtrennung mit
NaI-Schwerlösung als mögliches Referenzmaterial für umweltrelevante Prozessstudien –
Exemplarische Testungen an einer Gewässerprobe
Mitt Umweltchem Ökotox **30** (1), 19 - 23
Main topic T5; Secondary topic T4

Book chapters

43. **Borchardt, D.** (2024):
Warum eine "Wasserwende" in Deutschland zwingend notwendig ist
In: Ammermüller, B., Münch, R., Schulz von Thun, F., Wagner, C., Witte, S. (Hrsg.)
Bitte Wenden. Pointierte Beiträge zu den Herausforderungen unserer Zeit
VKU, München; Berlin, S. 90 - 97
Main topic T5; Secondary topic T4
44. Spank, U., Mauder, M., **Aurich, P.**, Bernhofer, C., **Koschorreck, M.** (2024):
Müssen Treibhausgasemissionen und Verdunstungsraten über dem Freiwasserbereich
ausgedehnter Wasserflächen neu bewertet werden?
In: Busch, U. (Hrsg.)
*10. Fachtagung BIOMET des Fachausschusses Biometeorologie der DMG e.V.: 19. bis
21. März 2024 in Offenbach; Programm und Zusammenfassungen*
Annalen der Meteorologie 53
Deutscher Wetterdienst, Offenbach am Main, S. 62 - 65
Main topic T5; Secondary topic T4

Conference papers

45. **Musolff, A., Ledesma, J.L.J., Nguyen, V.T., Ebeling, P., Sarrazin, F., Borchardt, D., Attinger, S., Kumar, R.** (2024):
Riverine nitrogen exports to the Wadden Sea – a travel time-based modelling approach
EGU General Assembly 2024, Vienna, Austria, 14–19 Apr 2024
EGUsphere
Copernicus Publications, EGU24-10273 [10.5194/egusphere-egu24-10273](https://doi.org/10.5194/egusphere-egu24-10273)
Main topic T5; Secondary topic T4
46. **Nguyen, V.T., Kumar, R., Ledesma, J.L.J., Ebeling, P., Fleckenstein, J.H., Musolff, A.** (2024):
Towards understanding the effects of climate and land cover change on dissolved organic carbon export in temperate forest catchments
EGU General Assembly 2024, Vienna, Austria, 14–19 Apr 2024
EGUsphere
Copernicus Publications, EGU24-9157 [10.5194/egusphere-egu24-9157](https://doi.org/10.5194/egusphere-egu24-9157)
Main topic T5; Secondary topic T4
47. **Pesce, M., Viglione, A., von Hardenberg, J., Tarasova, L., Basso, S., Merz, R., Parajka, J., Tong, R.** (2024):
Regional multi-objective calibration for distributed hydrological modelling: a decision tree based approach
In: Cudennec, C., Grimaldi, S. (eds.)
Hydrological Sciences in the Anthropocene. Vol. 2: Variability and change across space, time, extremes, and interfaces - IAHS Scientific Assembly 2022, Montpellier, 29 May-3 June 2022
Proceedings of IAHS 385
International Association of Hydrological Sciences (IAHS),
Wallingford, Oxfordshire, 65 - 69 [10.5194/piahs-385-65-2024](https://doi.org/10.5194/piahs-385-65-2024)
Main topic T5; Secondary topic T4
48. **Plamper, P., Lechtenfeld, O.J., von Tümpling, W., Groß, A.** (2024):
A snapshot-based knowledge graph model for temporal link prediction
In: Yamaguchi, A., Egami, S., Kozaki, K., Kawamura, T., Villazón-Terrazas, B., Buranarach, M. (eds.)
Proceedings of the Workshop, Poster and Demonstration Sessions at IJCKG 2023, co-located with 12th International Joint Conference on Knowledge Graphs (IJCKG 2023), Tokyo, Japan, December 8-9, 2023
CEUR Workshop Proceedings 3659
Rheinisch-Westfälische Technische Hochschule (RWTH), Aachen, 64 - 79
Main topic T9; Secondary topics T5, T4

Preprints

49. **Aurich, P.**, Spank, U., **Koschorreck, M.** (2024):
Surface CO₂ gradients challenge conventional CO₂ emission quantification in lentic water
bodies under calm conditions
EGUsphere [10.5194/egusphere-2024-2550](https://doi.org/10.5194/egusphere-2024-2550)
Main topic T5; Secondary topic T4

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