

<Curriculum Vitae>

Prof. Mag Dr. Wolfgang Wanek

ORCID number 0000-0003-2178-8258

Division of Terrestrial Ecosystem Research

Department of Microbiology and Ecosystem Science

Center of Microbiology and Environmental Systems

Science

University of Vienna

Djerassiplatz 1, 1030 Vienna, Austria

PHONE ++43 1 4277 91262

EMAIL wolfgang.wanek@univie.ac.at

WEB <http://ter.csb.univie.ac.at/people/wolfgang-wanek>

Research topics

- Stable isotope fractionation in plants, microorganisms and ecosystems
- Element cycling in temperate and tropical grasslands and forests, with focus on carbon, nitrogen and phosphorus
- Global change effects on biogeochemical cycles
- Development of isotope-tracing methods to study nutrient transformation processes in soils

Research achievements in numbers (since 1993)

- 226 papers in peer-reviewed journals (12443 citations in ISI, H-index 58), 6 book chapters
- 34 invited talks at national and international conferences or institutions
- 12 research grants (total budget ~5.5 million €)

Language skills

German (mother tongue), English (excellent), Spanish (basics)

Personal data

Born 1967 in Vienna, Austria - One child (born 2008)

Higher education

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| 2006 | Habilitation (Venia Docendi) in Physiological Ecology and Ecosystem Research obtained at the University of Vienna |
| 1993-1996 | PhD, Plant Sciences, University of Vienna (PhD thesis Mechanisms of D-ononitol accumulation in <i>Vigna umbellata</i> under drought stress) |
| 1992-1993 | Diploma, Botany, University of Vienna (Diploma thesis Metabolism of host-derived sorbitol by the mistletoe <i>Viscum album</i>) |

Appointments

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| Since 2019 | Full professor, Center of Microbiology and Environmental Systems Science, University of Vienna |
| 2006-2019 | Associate professor, Department of Chemical Ecology and Ecosystem Research, now: Department of Microbiology and Ecosystem Science, University of Vienna |
| 2001-2006 | Assistant professor, Institute of Ecology and Conservation Biology, University of Vienna |
| 1997-2001 | Research Assistant "Universitätsassistent", Institute of Plant Physiology, University of Vienna |

Funded projects (last 5 years)

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| 2023-2027 | Microbiomes drive planetary health. FWF Austrian Science Fund , Cluster of Excellence, 20.997.662€, co-PI Wolfgang Wanek |
| 2022-2024 | Adapting future tree species composition of the Vienna woods to possible consequences of climate change based on past drought responses, as indicated by forest site, soil and tree ring parameters. Waldfonds – BMLRT , 718.000 €, co-PI Wolfgang Wanek |
| 2019-2021 | Decadal forest soil warming: effects on soil C and nutrient dynamics and GHG fluxes. FWF Austrian Science Fund , D-A-Ch project, 622.050€, co-PI Wolfgang Wanek |

- 2015-2019 MicrON: Environmental controls of microbial organic nitrogen cycling in soils. **FWF Austrian Science Fund**, 446.320€, PI Wolfgang Wanek
- 2016-2019 ClimGrass: Grassland carbon dynamics in a changing climate. **FWF Austrian Science Fund**, 414.726€, co-PI Wolfgang Wanek
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Other selected activities

- Manager/head of SILVER laboratory (Stable Isotope Laboratory for Environmental Research, Univ. Vienna)
 - Editorial board member of Soil Systems (MDPI Publishers) and Soil Biology and Biochemistry (Elsevier), ad-hoc Referee for more than 25 journals including Nature, Global Change Biology, Ecology Letters, Nature Communications; funding agencies incl. ARC Australia, NERC UK, NWO Netherlands, SNF Switzerland
 - Founding member and coordinator of the Stable Isotope Network Austria (2004-2011), co-initiator of JESIUM (Joint European Isotope User Meeting)
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Publication summary

Highly Cited Researcher by Clarivate 2020, 2022-2024. 226 papers in peer-reviewed journals, **6 book chapters**; H-index: **58** (Scopus).

Google Scholar <https://scholar.google.com/citations?hl=de&user=21ayro4AAAAJ>

Scopus <https://www.scopus.com/authid/detail.uri?authorId=6701527006>

ORCID orcid.org/0000-0003-2178-8258

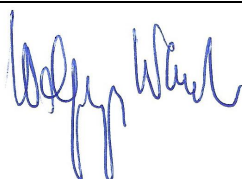
Recent publications (2022-2024):

1. Nemetschek D., Fortunel C., Marcon E., Auer J., Badouard V., Baraloto C., Boisseaux M., Bonal D., Coste S., Dardevette E., Heuret P., Hietz P., Levionnois S., Maréchaux I., Stahl C., Vleminckx J., **Wanek W.**, Ziegler C., Derroire G. (2024) Love thy neighbour? Tropical tree growth and its response to climate anomalies is mediated by neighbourhood hierarchy and dissimilarity in carbon and water related traits. *Ecology Letters* **X**, YY. doi: 10.22541/au.171366417.71658960/v1. In press.
2. Knight C.G., Nicolitch O., Griffiths R.I., Goodall T., Jones B., Weser C., Langridge H., Davison J., Dellavalle A., Eisenhauer N., Gongalsky K.B., Hector A., Jardine E., Kardol P., Maestre F.T., Schädler M., Semchenko M., Stevens C., Tsiafouli M.A., Vilhelmsson O., **Wanek W.**, de Vries F.T. (2024) Soil microbiomes show consistent and predictable responses to extreme events across climates. *Nature* **X**, YY. doi: 10.1038/s41586-024-08185-3. In press.
3. Lee U.-J., Gwak J.-H., Choi S., Jung M.-Y., Lee T.K., Ryu H., Awala S.I., **Wanek W.**, Wagner M., Quan Z.-X., and Rhee S.-K. (2024) "Ca. Nitrosocosmicus" members are the dominant archaea associated with plant rhizospheres. *mSphere* **X**, YY. doi: 10.1101/2024.01.08.574571. In press.
4. Zhu Z., **Wanek W.**, Gao K., Fang Y., Li D. (2024) Increasing plant species diversity benefits soil protein accumulation in a subtropical forest. *Journal of Applied Ecology* **X**, YY. doi: 10.1111/1365-2664.14793.
5. Spohn M., **Wanek W.** (2024) Quantifying element fluxes using radioisotopes. *New Phytologist* **X**: YY. doi: 10.1111/nph.20203. In press.
6. Liu X., Heinzle J., Tian Y., Salas E., Kwatcho-Kengdo S., Borken W., Schindlbacher A., **Wanek W.** (2024) Long-term soil warming changes the profile of primary metabolites in fine roots of Norway Spruce in a temperate montane forest. *Plant Cell Environment* **47**:4212-4226. doi: 10.1111/pce.15019.
7. Shi K., Liao J., Zou X., Chen H.Y.H., Delgado-Baquerizo M., **Wanek W.**, Ni J., Ren T., Zhang C., Yan Z., Ruan H. (2024) Forest development induces soil aggregate formation and stabilization: implications for sequestration of soil carbon and nitrogen. *Catena* **246**: 108363. doi: 10.1016/j.catena.2024.108363.
8. Liu X., Tian Y., Heinzle J., Salas E., Kwatcho-Kengdo S., Borken W., Schindlbacher A., **Wanek W.** (2024) Long-term soil warming decreases soil microbial necromass carbon by adversely affecting its production and decomposition. *Global Change Biology* **30**: e17379. doi: 10.1111/gcb.17379
9. Tang S., Pan W., Ma Q., **Wanek W.**, Marsden K.A., Kuzyakov Y., Chadwick D.R., Wu L., Gregory A., Jones D.L. (2024) Soil nitrogen and phosphorus regulate decomposition of organic nitrogen compounds in the

- Rothamsted experiment. *Soil Biology and Biochemistry* **196**: 109502. doi: 10.1016/j.soilbio.2024.109502.
10. Zientek A., Schagerl M., Nagy M., **Wanek W.**, Heinz P., Ali S.S., Lintner M. (2014) Effect of micro-plastic particles on coral reef foraminifera. *Scientific Reports* **14**: 12423. doi: 10.1038/s41598-024-63208-3
 11. Paces B., **Wanek W.**, Voigt C.C., Schirmer S., Leidinger P., Schulze C.H. (2024) Trophic Position determines the Persistence of Neotropical Understory Birds after Forest Disturbance. *Ecology and Evolution* **14**: e11370. doi: 10.1002/ece3.11370
 12. Mao X., Sun T., Zhu L., **Wanek W.**, Cheng Q., Wang X., Zhou J., Liu X., Ma Q., Wu L., Jones D.L. (2024) Microbial adaptation to stoichiometric imbalances regulated the size of soil mineral-associated organic carbon pool under continuous organic amendments. *Geoderma* **445**: 16883. doi: 10.1016/j.geoderma.2024.116883
 13. Sun L., Qu L., Moorhead D. L., Cui Y., **Wanek W.**, Li S., Sang C., Wang C. (2024) Interpreting the differences in microbial carbon and nitrogen use efficiencies estimated by ¹⁸O labeling and coenzyme stoichiometry. *Geoderma* **444**: 116856. doi: 10.1016/j.geoderma.2024.116856
 14. Bechtold E., **Wanek W.**, Nuesslein B., DaCosta M., Nüsslein K. (2024) Successional changes in bacterial phyllosphere communities are plant-host species dependent. *Applied and Environmental Microbiology* **90**: e01750-23. doi: 10.1128/aem.01750-23
 15. Bubl M., Heinz P., **Wanek W.**, Schagerl M., Hofmann T., Lintner M. (2024) Impact of heavy metals (Cu, Fe, Pb, Zn) on carbon and nitrogen uptake of the diatom-bearing benthic foraminifera *Heterostegina depressa*. *Heliyon* **10**: e27229. doi: 10.1016/j.heliyon.2024.e27229
 16. Lintner M., Schagerl M., Lintner B., **Wanek W.**, Golén J., Tyszka J., Heinz P. (2024) Impact of pesticides on marine coral reef foraminifera. *Marine Pollution Bulletin* **201**: 116237. doi: 10.1016/j.marpollbul.2024.116237
 17. Nemetschek D., Derroire G., Marcon E., Aubry-Kientz M., Auer J., Badouard V., Baraloto C., Bauman D., Le Blaye Q., Boisseaux M., Bonal D., Coste S., Dardevet E., Heuret P., Hietz P., Levionnois S., Maréchaux I., McMahan S., Stahl C., Vleminckx J., **Wanek W.**, Ziegler C., Fortunel C. (2024) Climate anomalies and neighbourhood crowding interact in shaping tree growth in old-growth and selectively-logged tropical forests. *Journal of Ecology* **112**: 590-612. doi: 10.1111/1365-2745.14256
 18. Estevez E., Dietrich D., Sahler S., Vassanelli F., Wildera S., Martini J., **Wanek W.**, Singer G. (2024) The upper Neretva River discontinuum: gradients of taxonomic and functional diversity of benthic invertebrates in a wild Balkan river. *Natura Sloveniae* **25**: 111-135. doi: 10.14720/ns.25.3.111-135
 19. Salas E., Gorfer M, Bandian D., Eichorst S.A., Schmidt H., Horak J., Rittmann S.K.-M.R., Schleper C., Reischl B., Pribasnič T., Jansa J., Kaiser C., **Wanek W.** (2024) Reevaluation and novel insights into amino sugar and neutral sugar necromass biomarkers in archaea, bacteria, fungi, and plants. *Science of the Total Environment* **906**: 167463. doi: 10.1016/j.scitotenv.2023.167463
 20. Asemoloye M.D., Sherifdeen Bello T., Olusakin Oladoye P., Gbadamosi M., Babarinde S.O., Adebami G., Olumayowa M.O., Temporiti M.E., **Wanek W.**, Marchisio M.A. (2023) Engineered yeasts and lignocellulosic biomaterials: Shaping a new dimension for biorefinery and global bioeconomy. *Bioengineered* **14**: 2269328. doi: 10.1080/21655979.2023.2269328
 21. Gorka S., Darcy S., Salas Hernández E., Horak J., Imai B., Mohrlök M., Richter A., Schmidt H., **Wanek W.**, Kaiser C., Canarini A. (2023) Concurrent extraction of neutral and glycolipid fatty acids provides new insights into soil microbial communities. *Soil Biology & Biochemistry* **187**: 109205. doi: 10.1016/j.soilbio.2023.109205
 22. Sun L., Moorhead D.L., **Wanek W.**, Li S., Cui Y., Bai E. (2023) Exogenous nitrogen input skews estimates of microbial nitrogen use efficiency by coenzymatic stoichiometry. *Ecological Applications* **12**: 46. doi: 10.1186/s13717-023-00457-6
 23. Watzinger A., Prommer J., Spiridon A., Kisielinska W., Hood-Nowotny R., Leitner S., **Wanek W.**, Resch C., Heilig M., Murer, E. Formayer H., Wawra A., Miloczki J. (2023) Functional redundant soil fauna and microbial groups and processes were fairly resistant to drought in an agroecosystem. *Biology and Fertility of Soils* **59**: 629–641. doi: 10.1007/s00374-023-01728-2.
 24. Tian Y., Schindlbacher A., Urbina Malo C., Shi C., Heinzle J., Kwatcho Kengdo S., Inselsbacher E., Borken W., **Wanek W.** (2023) Long-term warming of a forest soil reduces microbial biomass and its carbon and nitrogen use efficiencies. *Soil Biology & Biochemistry* **184**: 109109. doi: 10.1016/j.soilbio.2023.109109
 25. Lintner M., Lintner B., Schagerl M., **Wanek W.** Heinz P. (2023) The change in metabolic activity of a large benthic foraminifera as a function of light supply. *Scientific Reports* **13**: 8240. doi.org/10.1038/s41598-023-35342-x
 26. Heinzle J., Liu X., Tian Y., Kwatcho Kengdo S., Heinze B., Nirschi A., Borken W., Inselsbacher E., **Wanek W.**, Schindlbacher A. (2023) Increase in fine root biomass enhances root exudation by long-term soil

- warming in a temperate forest. *Frontiers in Forests and Global Change* **6**: 1152142. doi: 10.3389/ffgc.2023.1152142
27. Shi C., Urbina-Malo C., Tian Y., Heinzle J., Kwatcho Kengdo S., Inselsbacher E., Borken W., Schindlbacher A., **Wanek W.*** (2023) Does long-term soil warming affect microbial element limitation? A test by short-term assays of microbial growth responses to labile C, N and P additions. *Global Change Biology* **29**: 2188-2202. doi: 10.1111/gcb.16591
 28. Sun L., Li J., Qu L., Wang X., Sang C., Wang J., Sun M., **Wanek W.**, Moorhead D.L., Bai E., Wang C. (2023) Phosphorus limitation reduces microbial nitrogen use efficiency by increasing extracellular enzyme investments. *Geoderma* **432**: 116416. doi: 10.1016/j.geoderma.2023.116416
 29. Maxwell T.L., Augusto L., Tian Y., **Wanek W.**, Fanin N. (2023) Water availability is a stronger driver of soil microbial processing of organic nitrogen than tree species composition. *European Journal of Soil Science* **74**: e13350. doi: 10.1111/ejss.13350
 30. Wasner D., Prommer J., Zezula D., Mooshammer M, Hu Y., **Wanek W.*** (2023) Tracing ³³P-labelled organic phosphorus compounds in two soils: New insights into decomposition dynamics and direct use by microbes. *Frontiers in Soil Science* **3**:1097965. doi: 10.3389/fsoil.2023.1097965
 31. Tian Y., Shi S., Urbina Malo C., Kwatcho Kengdo S., Heinzle J., Inselsbacher E., Ottner F., Borken W., Michel K., Schindlbacher A., **Wanek W.*** (2023) Long-term soil warming decreases microbial phosphorus utilization by increasing abiotic phosphorus sorption and phosphorus losses. *Nature Communications* **14**: 864 doi: 10.1038/s41467-023-36527-8
 32. Crittenden P.D., Ellis C.J., Smith R.I., **Wanek W.**, Thornton B. (2023) Loss of nitrogen fixing capacity in a montane lichen is linked to increased nitrogen deposition. *Journal of Ecology* **111**: 288-299. doi: 10.1111/1365-2745.14056
 33. Castan S., Sherman A., Peng R., Zumstein M., **Wanek W.**, Hüffer T., Hofmann T. (2023) Uptake, metabolism and accumulation of tire wear particle-derived compounds in lettuce. *Environmental Science & Technology* **57**: 168–178. doi: 10.1021/acs.est.2c05660
 34. Zheng J., Fujii K., Koba K., **Wanek W.**, Müller C., Jansen-Willems A.B., Nakajima Y., Wagai R., Canarini A. (2023) Revisiting process-based simulations of soil nitrite dynamics: Tighter cycling between nitrite and nitrate than considered previously. *Soil Biology & Biochemistry* **178**: 108958. doi: 10.1016/j.soilbio.2023.108958
 35. Lintner M., Wildner M., Lintner B., **Wanek W.**, Heinz P. (2023) Spectroscopic analysis of sequestered chloroplasts in *Elphidium williamsoni* (Foraminifera). *Journal of Photobiology and Photochemistry: Biology* **238**: 112623. doi: 10.1016/j.jphotobiol.2022.112623
 36. Heinzle J., Kitzler B., Zechmeister-Boltenstern S., Tian Y., Kwatcho-Kengdo S., **Wanek W.***, Borken W., Schindlbacher A. (2023) Soil CH₄ and N₂O response diminishes during decadal soil warming in a temperate mountain forest. *Agricultural and Forest Meteorology* **329**: 109287. doi: 10.1016/j.agrformet.2022.109287
 37. Salas E., Gorfer M., Bandian D., Wang B., Kaiser C., **Wanek W.** (2023) A rapid and sensitive assay to quantify amino sugars, neutral sugars and uronic acid necromass biomarkers using pre-column derivatization and ultra-high-performance liquid chromatography coupled to high-resolution mass spectrometry. *Soil Biology & Biochemistry* **177**: 108927. doi: 10.1016/j.soilbio.2022.108927
 38. Kwatcho Kengdo S., Ahrens B., Ye Tian, Heinzle J., **Wanek W.**, Schindlbacher A., Borken W. (2023) Increase in carbon input by enhanced fine root turnover in a long-term warmed forest soil. *Science of the Total Environment* **855**: 158800. doi: 10.1016/j.scitotenv.2022.158800
 39. Kohl L., **Wanek W.**, Keiblinger K., Hämmerle I., Fuchsluger L., Schneider T., Riedel K., Eberl L., Zechmeister-Boltenstern S., Richter A. (2023) Nutrient controls on carbohydrate and lignin decomposition in beech litter. *Geoderma* **429**: 116276. doi: 10.1016/j.geoderma.2022.116276
 40. Noll L., Zhang S, Zheng Q., Hu Y, Hofhansl F., **Wanek W.*** (2022) Climate and geology overwrite land use effects on soil organic nitrogen cycling on a continental scale. *Biogeosciences* **19**: 5419–5433. doi: 10.5194/bg-2022-41
 41. Reyes-Garcia C., Pereira-Zaldívar N.A., Espadas-Manrique C., Tamayo-Chim M., Chilpa-Galván N., Cach-Pérez M.J., Ramírez-Medina M., Benavides A.M., Hietz P., Zotz G., Andrade J.L., de Paula Oliveiras R., Einzmann H.J.R., Guzmán Jacob V., Krömer T., Males J., Pinzón J.P., Sarmiento Cabral J., **Wanek W.**, Cardelous C., Woods C. (2022) New proposal of epiphytic Bromeliaceae functional groups to include nebulophytes and shallow tanks. *MDPI Plants* **11**: 3151. doi: 10.3390/plants11223151
 42. Fricko N., **Wanek W.**, Fellner J. (2022) Applying the ¹⁵N labelling technique to material derived from a landfill simulation experiment to understand nitrogen cycle processes under aerobic and anaerobic conditions. *Biodegradation* **33**: 557-573. doi: 10.1007/s10532-022-10000-7

43. Biasi C., Jokinen S., Prommer J., Ambus P., Dörsch P., Yu L., Granger S., Boeckx P., Van Nieuland K., Brüggemann N., Wissel H., Voropaev A., Zilberman T., Jäntti H., Trubnikova T., Welti N., Voigt C., Gebus-Czupyt B., Czupyt Z., **Wanek W.** (2022) Challenges in measuring nitrogen isotope signatures in inorganic nitrogen forms: an inter-laboratory comparison of three common measurement approaches. *Rapid Communications in Mass Spectrometry* **36**: e9370. doi: 10.1002/rcm.9370
44. Liu X., Chen S., Li X., Yang Z., Xiong D., Xu C., **Wanek W.**, Yang Y. (2022) Soil warming delays leaf litter decomposition but exerts no effect on litter nutrient release in a subtropical natural forest over 450 days. *Geoderma* **427**: 116139. doi: 10.1016/j.geoderma.2022.116139
45. Xue Z., Liu C., Zhou Z., **Wanek W.*** (2022) Extracellular enzyme stoichiometry reflects the metabolic C- and P-limitations along a grassland succession on the Loess Plateau in China. *Applied Soil Ecology* **179**: 104594. doi: 10.1016/j.apsoil.2022.104594
46. Lintner M., Schagerl M., Lintner B., **Wanek W.**, Keul N., Heinz P. (2022) Effect of light on the metabolism of the foraminifera *Criboelphidium selseyense* lacking photosymbionts and kleptoplasts. *Journal of Photochemistry and Photobiology* **11**: 100133. doi: 10.1016/j.jpap.2022.100133
47. Guzman-Jacob V., Guerrero Ramirez N., Craven D., Brant Paterno G., Taylor A., Kromer T., **Wanek W.**, Zotz G., Kreft H. (2022) Broad- and small-scale environmental gradients drive variation in chemical, but not morphological, leaf traits of vascular epiphytes. *Functional Ecology* **36**: 1858. doi: 10.1111/1365-2435.14084
48. Schindlbacher, A., Heinzle, J., Gollobich, G., **Wanek, W.**, Michel, K., Kitzler, B. (2022) Soil greenhouse gas fluxes in floodplain forests of the Danube National Park – Effects of flooding and soil microclimate. *Biogeochemistry* **159**: 193–213. doi: 10.1007/s10533-022-00921-z
49. Mohn J., Biasi C., Bodé S., Boeckx P., Brewer P.J., Eggleston S., Geilmann H., Guillevic M., Kaiser J., Kantnerová K., Moossen H., Nakagawa M., Pearce R., von Rein I., Ruppacher J., Steger D., Toyoda S., **Wanek W.**, Wexler S., Yoshida N. & Yu L. (2022) Isotopically-characterised N₂O reference materials for use as community standards. *Rapid Communications in Mass Spectrometry* **36**: e9296. doi: 10.1002/rcm.9296
50. Kwatcho Kengdo S., Peršoh D., Schindlbacher A., Heinzle J., Tian Y., **Wanek W.**, Borken W. (2022) Long-term soil warming alters fine root dynamics and morphology, and their ectomycorrhizal fungal community in a temperate forest soil. *Global Change Biology* **28**:3441–3458. doi: 10.1111/gcb.16155
51. Valiente N., Jirsa F., Hein T., **Wanek W.**, Prommer J., Bonin P., Gómez-Alday J.J. (2022) The role of coupled DNRA-Anammox during nitrate removal in a highly saline lake. *Science of the Total Environment* **806**: 150726. doi: 10.1016/j.scitotenv.2021.150726
52. Maxwell T.L., Canarini A., Bigdanovic I., Böckle T., Martin V., Noll L., Prommer J., Seneca J., Simon E., Piepho H.-P., Herndl M., Pötsch E.M., Kaiser C., Richter A., Bahn M., **Wanek W.** (2022) Contrasting drivers of belowground nitrogen cycling in a montane grassland exposed to a multifactorial global change experiment with elevated CO₂, warming, and drought (2022) *Global Change Biology* **28**: 2425-2441. doi: 10.1111/gcb.16035
53. Hietz P., Wagner K., Nunes Ramos F., Cabral J., Agudelo C., Benavides A.-M., Cach-Pérez M.-J., Cardelús C., Chilpa Galván N., Costa L., de Paula Oliveira R., Einzmann H., Farias R., Guzmán Jacob V., Kattge J., Kessler M., Kirby C., Kreft H., Kromer T., Males J., Monsalve Correa S., Moreno-Chacón M., Petter G., Reyes-García C., Saldana A., Schellenberger Costa D., Taylor A., Velázquez Rosas N., **Wanek W.**, Woods C., Zotz G. (2022) Putting vascular epiphytes on the traits map. *Journal of Ecology* **110**: 340-358. doi: 10.1111/1365-2745



Signature: Prof. Dr. Wolfgang Wanek