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Research Interests

Earth System Science, Global Biogeochemical Cycles, Soils in the Earth System, Systemic Risks, Climate Extremes and their Impacts on Ecosystems and Societies, Application of Artificial Intelligence/Machine Learning to Spatiotemporal Dynamics and for Early Warning

Academic and professional career

- 10/2022- Amazon Scholar (AWS AIRE DeepEarth, A. Smola/ M. Li).
- 01/2022- Founding director ELLIS Unit Jena.
- 2021 (Jan/Feb) Guest professor at University Innsbruck, Austria.
- 2014- Founding co-director of the Michael-Stifel-Center Jena for Data-driven and Simulation Science, Friedrich-Schiller-University of Jena (re-elected 2018).
- 07/2014- Professor for Global Geoecology at the Friedrich Schiller University Jena.
- 2014- Managing Director, Max-Planck-Institute for Biogeochemistry, Jena (rotating)
- 07/2012- Director, Department Biogeochemical Integration, Max-Planck-Institute for Biogeochemistry, Jena.
- 2006-2012 Max Planck Research Group Leader at Max-Planck-Institute for Biogeochemistry, Jena, Biogeochemical Model-Data-Integration Group.
- 2004–2006 EU-Marie-Curie research fellow at Forest Ecology Lab, Department of Forest Science and Environment, University of Tuscia, Italy.
- 2001–2003 Graduate Research Assistant, teaching and internal co-ordination of the Terrestrial Process Integration Group at Department of Plant Ecology, University of Bayreuth (BMBF Project GLOWA-Danube, EU Projects Carbodata and CarboEuroflux).
- 1998–2001 Graduate Research Assistant, Department of Plant Ecology, University of Bayreuth (EU research projects MEDEFU, and VOCAMOD).
- 1998–2001 PhD study; Thesis: *'Drought effects on ecosystem carbon and water exchange in three Mediterranean forest ecosystems – a combined top-down and bottom-up analysis'* (summa cum laude), University of Bayreuth.
- 1992–1998 Diploma studies in Landscape Ecology, Institute of Landscape Ecology, University of Münster; Thesis: *'Microbial biomass and carbon mineralisation in the alpine forest-tundra ecotone at Stillberg (Davos, Switzerland)'* (with distinction).

Awards/Distinctions/Fellowships

2020	Gottfried Wilhelm Leibniz Prize 2020
2019-	ERC Synergy Grant USMILE Understanding and Modelling the Earth System with Machine Learning
2018	American Geophysical Union Piers J. Sellers Global Environmental Change Mid-Career Award
2014-2023	Highly cited researcher Geosciences 2017-2023, Environment and Ecology 2014-2021, additionally 2016 and 2018 in Agriculture Sciences, Thomson Reuters, USA/Canada
2013	Max-Planck Research Award (by Alexander-von-Humboldt foundation)
2010	Jim Gray (Microsoft) seed award for excellence in e-science
2009	Essential Science Indicators “Hot paper” (by Sciencewatch) for Moffat, Papale, Reichstein et al., 2007)
2008	ERC Starting Grant QUASOM
2008	“Rising star in Environment & Ecology” (Classified by essential science indicators - Sciencewatch)
2005, 2007, 2008	CARBOEUROPE best young scientist paper award for (1) Reichstein et al. (2005), Glob.Ch. Biol. 11, 1424-1439 (2) Owen, Tenhunen, Reichstein et al. (2007), Glob. Ch. Biol. 13:734-760 (3) Wutzler and Reichstein (2008), Biogeosciences 5:749-759.
2005	Marie-Curie Intra-European fellowship INTERMODE

Leadership, Committees and Memberships

2024-	Board member of the German Climate Consortium (DKK)
2022-	Member of the Selection Committee for the Award of the Alexander von Humboldt Professorship
2021-2024	Chair Steering Committee <i>Knowledge Action Network on Emergent Risks and Extreme Events</i> (a Future Earth, IRDR, WCRP and WWRP initiative)
2020-	Member of the Strategic Advisory Board of the research field Earth and Environment, Helmholtz Association of German Research Centres
2020-	Advisory board member of the Cluster of Excellence “Machine Learning: New Perspectives for Science“, University of Tübingen, Germany
2020-	Scientific Advisory Committee member of the Helmholtz Artificial Intelligence Cooperation Unit (HAICU)
2019-	Co-Spokesperson NFDI4Earth (Nationale Forschungsdateninfrastrukturen)
2019-	Member of the Thuringian State Science Committee (Landeswissenschaftskonferenz)
2019-	Member of the German Committee Future Earth
2018-2021	Chair Development Team <i>Knowledge Action Network on Emergent Risks and Extreme Events</i> (Future Earth, IRDR, WCRP and WWRP initiative)
2018	Founding interim-development team member of WRCR-IRDR-Future Earth Knowledge Action Network on Extreme Events and Emergent Risks
2017-2019	Spokesperson of DFG-Future-Earth AG Gesellschaftliche Resilienz und Klimaextreme (Societal Resilience and Climate Extremes)
2016-2020	Spokesperson of iDIV for the Max-Planck-Society Institutes
2016-2020	Scientific Advisory board for ICOS (Integrated Carbon Observation System)

2015-2019	Coordinator H2020 Project BACI: Detecting changes in essential ecosystem and biodiversity properties – towards a Biosphere Atmosphere Change Index (together with group leader Dr. Miguel Mahecha)
2014-	Member of the Specialized Panel of Scientific Experts pursuant to the Environmental Rules at the Permanent Court of Arbitration, The Hague, The Netherlands (2020 renewal for 6 yrs)
2014-	Member of the Climate Panel of the State of Thuringia (Reporting to Ministry of Environment), re-confirmed 2019
2014-2016	Lead scientist of the Future Earth Cluster Initiative Extreme Events and Environments from climate to Society (E ³ S)
2012	Lead author IPCC special report on Climate Extremes (SREX), WG I.
2009-2013	Coordinator FP7 Project CARBO-Extreme
2008-2014	iLEAPS/IGBP Scientific Steering Committee member
2007-2015	FLUXNET Synthesis Steering Committee

Editorial Board Member

One Earth (2019-), Global Sustainability (2018-2023), Agricultural and Forest Meteorology, Global Change Biology (2008–2018), Carbon Management (2010-2018), Journal of Geophysical Research – Machine Learning and Computation (2023-)

Organisation of scientific meetings

2005-	Regular (co-)convener of AGU and EGU sessions on carbon cycle, eco-hydrology, extreme events, systemic risks and societal resilience, remote sensing applications, soils and climate informatics.
2007-	Hosted and or (co-)organized numerous international workshops in the context of FLUXNET, E ³ S, EU FP6, FP7 and H2020 projects and others.

Ongoing funding

AI4PEX, (2024-2027), ELIAS (2023-), ELLIS Unit Jena *Machine Learning for Earth and Climate Sciences* (2021-2026) incl. CZS Junior Research Group (2022-2027); Open Earth Monitor (2022-2026), HK2023 VolkswagenStiftung: *Herrenhausen Conference Climate crisis and systemic risks: Lessons Learned from Covid-19* (2022-2024), H2020 *Myriad-EU* (2021-2025), H2020 *XAIDA* (2021-2025), DFG *NFDI4Earth* (2021-2026), H2020 *USMILE* (2020-2026); DLR *Project Office BIOMASS* (2020-2024); DFG center iDIV: *German Centre for Integrative Biodiversity Research Halle-Jena-Leipzig*; PI, since 2013.

Recent funding

H2020 *DeepCube* (2021-2023), DLR Project *DUKE* (2022-2023), DFG *SUBSOM* (2017-2021); VolkswagenStiftung: *Herrenhausen Conference Extreme Events – building climate resilient societies*, scientific lead (2018-2021); ESA *Land Surface Temperature CCI project* (2018-2021); DFG *SUBSOM The forgotten part of carbon cycling: Organic matter storage and turnover in subsoils* co-PI (2017-2021); DKN Future Earth Working Group *Societal resilience and climate extremes* (2017-2019); EU H2020 *Detecting changes in essential ecosystem and biodiversity properties – towards a Biosphere Atmosphere Change Index: BACI* (2015-2019); ESA *GlobBiomass*; PI 2015-2019; NIBIO *MOCABORS: Moisture dynamics and carbon*

sequestration in boreal soils PI since (2017-2019). **Supervision and co-supervision of PhD**

Theses (selection)

Benson (ongoing) *Deep learning and hybrid modeling of global vegetation and hydrology*.

El Ghawi (ongoing) *Hybrid machine-learning based modelling of biosphere-atmosphere interactions*.

Kariyathan (ongoing) *Biogeochemical insights from multi-tracer atmospheric flask data*.

Linscheid (ongoing) *Ecological process understanding across time scales*.

Pallandt-Vermeulen (ongoing) *Modelling the role of soil moisture dynamics on soil organic matter decomposition*.

Paulus (ongoing) *Land - atmosphere interactions in seasonally dry systems using lysimeter data*.

Upton (ongoing) *Machine-learning based estimation of ecosystem CO₂ fluxes constrained by atmospheric and ecosystem observations*.

Cortés (2024) *Novel approaches to spatio-temporal trend detection in environmental data*. Dissertation, Friedrich Schiller University Jena.

Denissen (2022) *Mapping terrestrial evaporation regimes – a data-driven analysis of land-atmosphere interactions under climate change*.

Kraft (2022) *Deep learning and hybrid modeling of global vegetation and hydrology*.

Trautmann (2022) *Understanding global water storage variations using model-data integration*.

Ahrens (2021) *Reconciling turnover models of roots and soil organic carbon with radiocarbon measurements*. Gottfried Wilhelm Leibniz Universität, Hannover.

Nelson (2021) *Ecosystem Transpiration from Eddy Covariance*. Friedrich-Schiller-Universität, Jena

Krämer (2020) *Developing an Earth System State Indicator*, University of Valencia, Spain.

Boese (2018) *Semi-Empirical Water-Use Efficiency Models from Local to Global Scale*, Friedrich-Schiller-Universität, Jena.

Knauer (2018) *Integrating observations and models to understand ecophysiological controls on terrestrial water-carbon coupling*, University of Freiburg.

Forkel (2015) *Controls on Global Greening, Phenology and the Enhanced Seasonal CO₂ Amplitude: Integrating Decadal Satellite Observations and Global Ecosystem Models*, Friedrich-Schiller-Universität, Jena, (Bernd Rendel Prize.)

Braakhekke (2014) *Mechanistic modelling of the vertical soil organic matter profile*, Univ., Wageningen.

Zscheischler (2014) *A global analysis of extreme events and consequences for the terrestrial carbon cycle*, Eidgenössische Technische Hochschule, Institut für Atmosphäre und Klima, Zürich (Otto-Hahn Medal 2015, and Wladimir-Köppen Prize 2016).

Görner (2011) *Improving data-oriented light use efficiency models of gross primary productivity with remotely sensed spectral indices*, Friedrich-Schiller-Universität, Jena.

Carvalhais (2010) *Iberian Peninsula ecosystem carbon fluxes; a model-data integration study*; Dissertação, Univ. Lisboa.

Lasslop (2010) *Model-data fusion for terrestrial biogeochemical models with carbon and water cycle observations*, Univ. Hamburg.

Mahecha (2009) *Ecosystem-atmosphere exchanges on multiple time scales*, Zürich ETH, Zürich (ETH Medal).

Supervision and co-supervision of Master, Diploma, and BSc Theses (selection)

Thomas (2012) *Reproducing FAPAR dynamics of Africa, based on climate, land use, and soil data using random forest*, Friedrich-Schiller-Universität, Diplom-Geographie, Jena.

Ahrens (2011) *Constraining a simple soil organic carbon model with 14C data*, Univ., Bayreuth.

- Angermüller (2009) *Influence of driving forces and ecosystem parameters on carbon uptake from weekly to interannual time scales*, Diplom-Geoökologie, Univ., Bayreuth.
- Fürst (2009) *Characterizing global spatiotemporal patterns of the fraction of absorbed photosynthetically active radiation*, Diplom-Geoökologie, Univ., Bayreuth.
- Milbradt (2008) *Exploration von MODIS-Zeitreihen zur Veränderungsanalyse im Zeitraum 2000-2007 am Beispiel des Land Surface Temperature Emissivity Produktes*. Friedrich-Schiller-Universität, Diplom-Geographie, Jena.
- Kuglitsch (2007) *Determinanten der Wassernutzungseffizienz in Europa und deren Veränderung bei verschiedenen Klimaszenarien*, Diplom-Geographie, Univ., Wien.
- Vollrath (2007) *Die Analyse der Vegetationsproduktivität im Krüger Nationalpark, Südafrika anhand von Eddy-Kovarianz- und Fernerkundungsdaten*. Friedrich-Schiller-Universität, BSc Geographie, Jena.

Teaching (selected courses)

- 2021 Course on „Model-data integration for natural sciences“, University Innsbruck, Austria.
- 2012- Integration of Remote Sensing, in-situ observation and modelling, Friedrich-Schiller-University Jena, Germany.
- 2011- Applied statistics & data analysis, Overview course on Global Biogeochemical Cycles: Global Water Cycle; IMPRS Global Biogeochemical Cycles; MPI-BGC/FSU-Jena, Germany.
- 2006- Integration of remote sensing, ecosystem observation and modelling (lecture, seminar and tutorial); Master Degree Geoinformatics, FSU Jena, Germany.
- 2002 Computing for Biologists, University of Bayreuth, Germany.
- 2001-2004 Ecological field practical course, University of Bayreuth, Germany.
- 2001-2003 Ecophysiological modelling, regional ecological excursions for geoecologists and biologists, University of Bayreuth, Germany.

Full publication list Markus Reichstein (without EGU/AGU conference abstracts)

Peer reviewed journals (incl. papers in discussion in peer reviewed journals and conferences)

2024

- Benson, Vitus, Claire Robin, Christian Requena-Mesa, Lazaro Alonso, Nuno Carvalhais, José Cortés, Zhihan Gao, Nora Linscheid, Mélanie Weynants, and **Markus Reichstein**. "Multi-modal Learning for Geospatial Vegetation Forecasting." In Proceedings of the IEEE/CVF Conference on Computer Vision and Pattern Recognition, pp. 27788-27799. 2024.
- Bogdanovich, E., Brenning, A., **Reichstein, M.**, DePolt, K., Guenther, L., Frank, D., and Orth, R.: Official heat warnings miss situations with a detectable societal heat response in European countries International Journal of Disaster Risk Reduction 100, 10.1016/j.ijdr.2023.104206, 2024.
- Cohrs, K.-H., Varando, G., Camps-Valls, G., Carvalhais, N., and **Reichstein, M.**: Double machine learning for causal hybrid modeling - applications in the earth sciences, 10.48550/arXiv.2402.13332, 2024.
- Estupinan-Suarez, L. M., Mahecha, M. D., Brenning, A., Kraemer, G., Poveda, G., **Reichstein, M.**, and Sierra, C.: Spatial patterns of vegetation activity related to ENSO in Northern South America, Journal of Geophysical Research: Biogeosciences, 129, 10.1029/2022jg007344, 2024.
- Han, B., Zhang, S., Shi, X., and **Reichstein, M.**: Bridging remote sensors with multisensor geospatial foundation models, 10.48550/arXiv.2404.01260, 2024.
- Jung, M., Nelson, J. A., Migliavacca, M., El-Madany, T. S., Papale, D., **Reichstein, M.**, Walther, S., and Wutzler, T.: Technical note: Flagging inconsistencies in flux tower data, Biogeosciences, 21, 1827 - 1846, 10.5194/bg-21-1827-2024, 2024.
- Liu, G., Migliavacca, M., Reimers, C., Kraft, B., **Reichstein, M.**, Richardson, A., Wingate, L., Delpierre, N., Yang, H., and Winkler, A.: DeepPhenoMem V1.0: Deep learning modelling of canopy greenness dynamics accounting for multi-variate meteorological memory effects on vegetation phenology, 10.5194/egusphere-2024-464, 2024.
- Nelson, J. A., Walther, S., Gans, F., Kraft, B., Weber, U., Novick, K., Buchmann, N., Migliavacca, M., Wohlfahrt, G., Šigut, L., Ibrom, A., Papale, D., Göckede, M., Duveiller, G., Knohl, A., Hörtnagl, L., Scott, R. L., Zhang, W., Hamdi, Z. M., **Reichstein, M.**, Aranda-Barranco, S., Ardö, J., de Beeck, M. O., Billdesbach, D., Bowling, D., Bracho, R., Brümmner, C., Camps-Valls, G., Chen, S., Cleverly, J. R., Desai, A., Dong, G., El-Madany, T. S., Euskirchen, E. S., Feigenwinter, I., Galvagno, M., Gerosa, G., Gielen, B., Godec, I., Goslee, S., Gough, C. M., Heinesch, B., Ichii, K., Jackowicz-Korczynski, M. A., Klosterhalfen, A., Knox, S., Kobayashi, H., Kohonen, K.-M., Korkiakoski, M., Mammarella, I., Mana, G., Marzuoli, R., Matamala, R., Metzger, S., Montagnani, L., Nicolini, G., O'Halloran, T., Ourcival, J.-M., Peichl, M., Pendall, E., Reverter, B. R., Roland, M., Sabbatini, S., Sachs, T., Schmidt, M., Schwalm, C. R., Shekhar, A., Silberstein, R., Silveira, M. L., Spano, D., Tagesson, T., Tramontana, G., Trotta, C., Turco, F., Vesala, T., Vincke, C., Vitale, D., Vivoni, E. R., Wang, Y., Woodgate, W., Yopez, E. A., Zhang, J., Zona, D., and Jung, M.: X-BASE: the first terrestrial carbon and water flux products from an extended data-driven scaling framework, FLUXCOM-X, 10.5194/egusphere-2024-165, 2024.
- Paulus, S., Orth, R., Lee, S.-C., Hildebrandt, A., Jung, M., Nelson, J. A., El-Madany, T. S., Carrara, A., Moreno, G., Mauder, M., Groh, J., Graf, A., **Reichstein, M.**, and Migliavacca, M.: Interpretability of negative latent heat fluxes from eddy covariance measurements in dry conditions. Biogeosciences 21 (8), pp. 2051 – 2085, 10.5194/bg-21-2051-2024, 2024.
- Poehls, J., Silva, L. A., Koirala, S., Carvalhais, N., and **Reichstein, M.**: Downscaling soil moisture to sub-km resolutions with simple machine learning ensembles, 10.2139/ssrn.4743411, 2024.
- Reichstein, M.**, Benson, V., Camps-Valls, G., Boran, H., Fearnley, C., Kornhuber, K., Rahaman, N., Schöllkopf, B., Tárraga, J. M., Vinuesa, R., Blunk, J., Dall, K., Denzler, J., Frank, D., Martini, G., Nganga, N., and Robinson, D. M.: Early warning of complex climate risk with integrated artificial intelligence2693-5015, 10.21203/rs.3.rs-4248340/v1, 2024.
- Stevens, B., Adami, S., Ali, T., Anzt, H., Aslan, Z., Attinger, S., Bäck, J., Baehr, J., Bauer, P., Bernier, N., Bishop, B., Bockelmann, H., Bony, S., Bresseur, G., Bresch, D. N., Breyer, S., Brunet, G., Buttigieg, P. L., Cao, J., Castet, C., Cheng, Y., Dey Choudhury, A., Coen, D., Crewell, S., Dabholkar, A., Dai, Q., Doblas-Reyes, F., Durran, D., El Gaidi, A., Ewen, C., Exarchou, E., Eyring, V., Falkinoff, F., Farrell, D., Forster, P. M., Frassoni, A., Frauen, C., Fuhrer, O., Gani, S., Gerber, E., Goldfarb, D., Grieger, J., Gruber, N., Hazeleger, W., Herken, R., Hewitt, C., Hoefler, T., Hsu, H.-H., Jacob, D., Jahn, A., Jakob, C., Jung, T., Kadow, C., Kang, I.-S., Kang, S., Kashinath, K., Kleinen-von Königslöw, K., Klocke, D., Kloenne, U., Klöwer, M., Kodama, C., Kollet, S., Kölling, T., Kontkanen, J., Kopp, S., Koran, M., Kulmala, M., Lappalainen, H., Latifi,

- F., Lawrence, B., Lee, J. Y., Lejeun, Q., Lessig, C., Li, C., Lippert, T., Luterbacher, J., Manninen, P., Marotzke, J., Matsouka, S., Merchant, C., Messmer, P., Michel, G., Michielsen, K., Miyakawa, T., Müller, J., Munir, R., Narayanasetti, S., Ndiaye, O., Nobre, C., Oberg, A., Oki, R., Özkan-Haller, T., Palmer, T., Posey, S., Prein, A., Primus, O., Pritchard, M., Pullen, J., Putrasahan, D., Quaas, J., Raghavan, K., Ramaswamy, V., Rapp, M., Rauser, F., **Reichstein, M.**, Revi, A., Saluja, S., Satoh, M., Schemann, V., Schemm, S., Schnadt Poberaj, C., Schulthess, T., Senior, C., Shukla, J., Singh, M., Slingo, J., Sobel, A., Solman, S., Spitzer, J., Stier, P., Stocker, T., Strock, S., Su, H., Taalas, P., Taylor, J., Tegtmeier, S., Teutsch, G., Tompkins, A., Ulbrich, U., Vidale, P.-L., Wu, C.-M., Xu, H., Zaki, N., Zanna, L., Zhou, T., and Ziemer, F.: Earth Virtualization Engines (EVE), *Earth System Science Data*, 16, 2113 - 2122, 10.5194/essd-16-2113-2024, 2024.
- Tao, F., Houlton, B. Z., Frey, S. D., Lehmann, J., Manzoni, S., Huang, Y., Jiang, L., Mishra, U., Hungate, B. A., Schmidt, M. W. I., **Reichstein, M.**, Carvalhais, N., Ciais, P., Wang, Y.-P., Ahrens, B., Hugelius, G., Hocking, T. D., Lu, X., Shi, Z., Viatkin, K., Vargas, R., Yigini, Y., Omuto, C., Malik, A. A., Peralta, G., Cuevas-Corona, R., Paolo, L. E. D., Luotto, I., Liao, C., Liang, Y.-S., Saynes, V. S., Huang, X., and Luo, Y.: Reply to: Contribution of carbon inputs to soil carbon accumulation cannot be neglected, *Nature* 627, pp. E4 - E6. 10.1101/2023.08.20.552557, 2024.
- Upton, S., **Reichstein, M.**, Gans, F., Peters, W., Kraft, B., and Bastos, A.: Constraining biospheric carbon dioxide fluxes by combined top-down and bottom-up approaches, *Atmospheric Chemistry and Physics* 24 (4), pp. 2555 – 2582, 10.5194/acp-24-2555-2024, 2024..
- Wang, S.; Yang, H.; Koirala, S.; Forkel, M.; **Reichstein, M.**; Carvalhais, N.: Understanding disturbance regimes from patterns in modeled forest biomass. *Journal of Advances in Modeling Earth Systems* 16 (6), e2023MS004099, 10.1029/2023MS004099, 2024.
- Zhan, C., Orth, R., Yang, H., **Reichstein, M.**, Zaehle, S., De Kauwe, M. G., Rammig, A., and Winkler, A.: Estimating the CO₂ fertilization effect on extratropical forest productivity from Flux-tower observations. *Journal of Geophysical Research: Biogeosciences* 129 (6), e2023JG007910, 2024.
- Zhang, W., Nelson, J. A., Miralles, D. G., Mauder, M., Migliavacca, M., Poyatos, R., **Reichstein, M.**, and Jung, M.: A new post-hoc method to reduce the energy imbalance in eddy covariance measurements, *Geophys Res Lett*, 51, 10.1029/2023gl107084, 2024.

2023

- Bastos, A., Sippel, S., Frank, D., Mahecha, M. D., Zaehle, S., Zscheischler, J., and **Reichstein, M.**: A joint framework for studying compound ecoclimatic events, *Nature Reviews Earth & Environment*, 10.1038/s43017-023-00410-3, 2023.
- Benson, V., Requena Mesa, C., Robin, C., Alonso, L., Cortes, J., Gao, Z., Linscheid, N., Weynants, M., and **Reichstein, M.**: Forecasting localized weather impacts on vegetation as seen from space with meteo-guided video prediction, 10.48550/arXiv.2303.16198, 2023.
- Bogdanovich, E., Guenther, L., **Reichstein, M.**, Frank, D., Ruhmann, G., Brenning, A., Denissen, J. M. C., and Orth, R.: Societal attention to heat waves can indicate public health impacts, *Weather, Climate, and Society*, 15, 557 - 569, 10.1175/wcas-d-22-0147.1, 2023.
- DePolt, K., Ward, P. J., de Ruiter, M., Bogdanovich, E., **Reichstein, M.**, Frank, D., and Orth, R.: Quantifying impact-relevant heatwave durations, 10.22541/essoar.168500314.44289092/v1, 2023.
- EIGHawi, R.; Kraft, B.; Reimers, C.; **Reichstein, M.**; Körner, M.; Gentine, P.; Winkler, A. J., 2023. Hybrid modeling of evapotranspiration: inferring stomatal and aerodynamic resistances using combined physics-based and machine learning. *Environmental Research* 18, 034039. <https://iopscience.iop.org/article/10.1088/1748-9326/acbbe0>
- Garcia-Garcia, A., Cuesta-Valero, F. J., Miralles, D. G., Mahecha, M. D., Quaas, J., **Reichstein, M.**, Zscheischler, J., and Peng, J.: Soil heat extremes can outpace air temperature extremes. *Nat. Clim. Chang.* **13**, 1237–1241 (2023). <https://doi.org/10.1038/s41558-023-01812-3>, 2023.
- Gomasasca, U., Migliavacca, M., Kattge, J., Nelson, J. A., Niinemets, Ü., Wirth, C., Cescatti, A., Bahn, M., Nair, R., Acosta, A., Arain, A., Beloiu, M., Black, T., Bruun, H. H., Bucher, F., Buchmann, N., Carrara, A., Byun, C., Conte, A., da Silva, A., Duveiller, G., Fares, S., Ibrom, A., Knohl, A., Komac, B., Limousin, J., Lusk, C., Mahecha, M., Martini, D., Minden, V., Montagnani, L., Mori, A., Onoda, Y., Penuelas, J., Perez-Priego, O., Poschlod, P., Powell, T., Reich, P., Šigut, L., van Bodegom, P., Walther, S., Wohlfahrt, G., Wright, I., and **Reichstein, M.**: Leaf-level coordination principles propagate to the ecosystem scale, 10.21203/rs.3.rs-2394473/v1, 2023.

- Kariyathan, T., Bastos, A., Marshall, J., Peters, W., Tans, P., and **Reichstein, M.**: Reducing errors on estimates of the carbon uptake period based on time series of atmospheric CO₂ Atmospheric Measurement Techniques, 16, 3299 - 3312, 10.5194/amt-16-3299-2023, 2023.
- Lee, H. T., Jung, M., Carvalhais, N., Trautmann, T., Kraft, B., **Reichstein, M.**, Forkel, M., Koirala, S., 2022. Diagnosing modeling errors of global terrestrial water storage interannual variability, Diagnosing modeling errors in global terrestrial water storage interannual variability. Hydrology and Earth System Sciences 27 (7), pp. 1531 – 1563, 10.5194/hess-27-1531-2023, 2023.
- Li, L., Wang, J., Franklin, M., Yin, Q., Wu, J., Camps-Valls, G., Zhu, Z., Wang, C., Ge, Y., and **Reichstein, M.**: Improving air quality assessment using physics-inspired deep graph learning, npj Climate and Atmospheric Science, 6, 10.1038/s41612-023-00475-3, 2023.
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