December 2022

Peer-reviewed ISI ranked journal articles, https://orcid.org/0000-0002-6301-1634

*(co-)advised graduate student, **(co-)advised postdoc, EH: Editor's Highlight, AW: Paper received an award

[59] *Fabiani, G., Barbeta, A., Penna, D., **Klaus, J.** (2022): Sapwood and heartwood are not isolated compartments: consequences for isotope ecohydrology. *Ecohydrology***,** e2478.

[58] *Bonanno, E., Blöschl, G., **Klaus, J.** (2022). Exploring tracer information in a small stream to improve parameter identifiability and enhance the process interpretation in transient storage models. *Hydrology and Earth System Sciences*., 26, 6003–6028, doi.org/10.5194/hess-26-6003-2022

[57] Benettin, P., Rodriguez, N.B., Sprenger, M., Kim, M., **Klaus, J.**, Harman, C., van der Velde, Y., Hrachowitz, M., Botter, G., McGuire, K., Kirchner, J., Rinaldo, A., McDonnell, J.J. (2022): Transit time estimation in catchments: Recent developments and future directions. *Water Resources Research*, 58 (11), e2022WR033096**.**

[56] **Klaus, J.**, Monk, W., Zhang, L., Hannah, D.M. (2022): Ecohydrological Interactions during Drought. *Ecohydrology*, 15(5), e2456.

[55] He, Q., Xu, B., Yetemen, Ö., Lütfi Şen, Ö., **Klaus, J.**, Schoppach, R., Çağlar, F., Yu Fan, P., Dieppois, B., Chen, L., Danaila, L., Massei, N., Chun, K.P. (2022): Impact of the North-Sea Caspian pattern on Meteorological drought and Vegetation Response over diverging environmental systems in western Eurasia. *Ecohydrology*, 15(5), e2446.

[54] *Fabiani, G., **Schoppach, R., Penna, D., **Klaus J.** (2022): Transpiration patterns and water use strategies of beech and oak trees along a hillslope. *Ecohydrology* 15(2), e2382.

[53] Dugdale, S., **Klaus, J.**, Hannah, D.M. (2022): Looking to the skies: realising the potential of drones and thermal infrared imagery to advance hydrological process understanding in headwaters. *Water Resources Research*, 58, e2021WR031168.

[52] *Glaser, B., Hopp, L., Partington, D., Brunner, P., Therrien, R., **Klaus, J.** (2021): Sources of surface water in space and time: Identification of delivery processes and geographical sources with hydraulic mixing-cell modelling. *Water Resources Research*, 57, e2021WR030332, https://doi.org/10.1029/2021WR030332

[51] **Schoppach, R., Chun, K.P, He, Q., *Fabiani, G., **Klaus, J.** (2021): Species-specific control of DBH and landscape characteristics on tree-to-tree variability of sap velocity. *Agriculture and Forest Meteorology*, 307, 108533, https://doi.org/10.1016/j.agrformet.2021.108533

[50] Chun, K.P., Dieppois, B., He, Q., Sidibe, M., Eden, J., Paturel, J.E., Mahe, G., Rouché, N., **Klaus, J.**, Conway, D. (2021): Identifying drivers of streamflow extremes in West Africa to inform a nonstationary prediction model. *Weather and Climate Extremes*, 33, https://doi.org/10.1016/j.wace.2021.100346.

[49] He, Q., Chun, K.P., Tan, M.L., Dieppois, B., Juneng, L., **Klaus, J.**, Fournier, M., Massei, N., Yetemen, O. (2021): Tropical drought patterns and their linkages to large-scale climate variability over Peninsular Malaysia. *Hydrological Processes*, 35, e14356, https://doi.org/10.1002/hyp.14356

[48] *****Bonanno, E., Blöschl, G., **Klaus, J.** (2021): Flow directions of stream-groundwater exchange in a headwater catchment during the hydrologic year. *Hydrological Processes*, 35, e14310, https://doi.org/10.1002/hyp.14310

[47] Radolinski, J., Pangle, L., **Klaus, J.**, Stewart, R.D. (2021): Testing the "Two Water Worlds" hypothesis under variable preferential flow conditions. *Hydrological Processes*, 35, e14252, https://doi.org/10.1002/hyp.14252

[46] Hissler, C., Martínez-Carreras, N., Barnich, F., Gourdol, L., Iffly, J.-F., Juilleret, J., **Klaus, J.**, Pfister, L. (2021): The Weierbach experimental catchment in Luxembourg: a decade of critical zone monitoring in a temperate forest - from hydrological investigations to ecohydrological perspectives. *Hydrological Processes*, 35, e14140.

[45] Sternagel, A., Loritz, R., **Klaus, J.**, Berkowitz, B., Zehe, E. (2021): Simulation of reactive solute transport in the critical soil zone: A Lagrangian model framework for transient flow and preferential transport across time scales, *Hydrology and Earth System Sciences*, 25, 1483–1508, 202.

[44] *Rodriguez, N.B., Pfister, L., Zehe, E., **Klaus, J.** (2021): A comparison of catchment travel times and storage deduced from deuterium and tritium tracers using StorAge Selection functions, *Hydrology and Earth System Sciences*, 25, 401–428, https://doi.org/10.5194/hess-25-401-2021

[43] *Rodriguez, N.B., Benettin, P., **Klaus, J.** (2020)[AW]: Multimodal water age distributions and the challenge of complex hydrological landscapes. *Hydrological Processes*, 34, 2707-2724.

[42] *Glaser, B., *Antonelli, M., Hopp, L., **Klaus, J.** (2020): Intra-catchment variability of surface saturation – insights from physically-based simulations in comparison with biweekly thermal infrared image observations. *Hydrology and Earth System Sciences*, 24, 1393–1413.

[41] *Antonelli, M., *Glaser, B., Teuling, A.J., **Klaus, J.**, Pfister, L. (2020): Saturated areas through the lens: 2. Spatio-temporal variability of streamflow generation and its relationship with surface saturation. *Hydrological Processes*, 34, 1333-1349.

[40] *Antonelli, M., *Glaser, B., Teuling, A.J., **Klaus, J.**, Pfister, L. (2020): Saturated areas through the lens: 1. Spatio-temporal variability of surface saturation documented through Thermal Infrared imagery. *Hydrological Processes*, 34, 1310-1332.

[39] Hopp, L., *Glaser, B., **Klaus, J.,** *Schramm, T. (2020): The relevance of preferential flow in catchment scale simulations: Calibrating a 3D dual-permeability model using DREAM. *Hydrological Processes*, 34, 1237–1254.

[38] *Rodriguez, N.B., **Klaus, J.** (2019)[AW]: Catchment travel times from composite StorAge Selection functions representing the superposition of streamflow generation processes. *Water Resources Research*, 55, 9292-9314.

[37] *Glaser, B., Hopp, L., Jackisch, C., **Klaus, J.** (2019): How meaningful are plot scale observations and simulations of preferential flow for catchment models? *Vadose Zone Journal*, 18:180146.

[36] **Carrer, G., **Klaus, J.**, Pfister, L. (2019): Assessing the Catchment Storage Function through a Dual-Storage Concept. *Water Resources Research*, 55, 476–494.

[35] *Glaser, B., *Antonelli, M., Chini, M., Pfister, L., **Klaus, J.** (2018): Technical note: Mapping surface saturation dynamics with thermal infrared imagery. *Hydrology and Earth System Sciences*, 22, 5987-6003.

[34] Penna, D., Hopp, L., Scandellari, F., Allen, S.T., Benettin, P., Beyer, M., Geris, J., **Klaus, J.**, Marshall, J.D., Schwendenmann, L., Volkmann, T.H.M., von Freyberg, J., Amin, A., Ceperley, N., Engel, M., Frentress, J.J.B., Giambastiani, Y., McDonnell, J.J., Zuecco, G., Llorens, P., Siegwolf, R.T.W., Dawson, T.E., Kirchner, J.W. (2018): Ideas and perspectives: Tracing terrestrial ecosystem water fluxes using hydrogen and oxygen stable isotopes – challenges and opportunities from an interdisciplinary perspective. *Biogeosciences*, 15, 6399-6415.

[33] **Klaus, J.**, Jackson, C.R. (2018)[EH, AW]: Interflow Is Not Binary: a Continuous Shallow Perched Layer Does Not Imply Continuous Connectivity. *Water Resources Research*, 54, 3988–4008.

[32] *Rodriguez, N.B., McGuire, K.J, **Klaus, J.** (2018): Time-varying storage - Water age relationships in a catchment with a Mediterranean climate. *Water Resources Research*, 54, 3988–4008.

[31] Danesh-Yazdi, M., **Klaus, J.**, Condon, L.E., Maxwell, R.M. (2018): Bridging the gap between numerical solutions of travel time distributions and analytical storage selection functions. *Hydrological Processes*, 32(8), 1063-1076.

[30] *Schwab, M.P., **Klaus, J.**, Pfister, L., Weiler, M. (2018): Diel fluctuations of viscosity-driven riparian inflow affect streamflow DOC concentration. *Biogeoscience*, 15, 2177-2188.

[29] Pfister, L., Wetzel, C.E., **Klaus, J.**, Martínez-Carreras, N., *Antonelli, M., Teuling, R., McDonnell, J.J. (2017): Terrestrial diatoms as tracers in catchment hydrology: A review. *WIREs Water*, e1241.

[28] 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., Schmidt, C., Rivett, M. O., Watts, G., Sabater, F., Sorolla, A., Turk, V. (2017): Ecohydrological interfaces as hotspots of ecosystem processes. *Water Resources Research*, 53, 6359–6376.

[27] Smettem, K.R.J., **Klaus, J.**, Harris, N.R., Pfister, L. (2017): New Potentiometric Wireless Chloride Sensors Provide High Resolution Information on Chemical Transport Processes in Streams. *Water* 2017, 9(7), 542.

[26] Pfister, L., Martínez-Carreras N., Hissler, C., **Klaus, J.**, **Carrer, G., Stewart, M., McDonnell, J.J. (2017)[AW]: Bedrock geology controls on catchment storage, mixing and release: a comparative analysis at the mesoscale. *Hydrological Processes*, 31(10), 1828-1845.

[25] *Antonelli, M., **Klaus, J.**, Smettem, K., Teuling, A.J., Pfister, L. (2017): Exploring Streamwater Mixing Dynamics via Handheld Thermal Infrared Imagery. *Water*, 9, 358.

[24] Martínez-Carreras, N., Hissler, C., Gourdol, L., **Klaus, J.,** Juilleret, J., Iffly, J., Pfister, L. (2016): Storage controls on the generation of double peak hydrographs in a forested headwater catchment. *Journal of Hydrology*, 543, 255–269.

[23] *Schwab, M.P., **Klaus, J.**, Pfister, L., Weiler, M. (2016): Diel discharge cycles explained through viscosity fluctuations in riparian inflow. *Water Resources Research*, 52 (11), 8744–8755.

[22] *Glaser, B., **Klaus, J.**, Frei, S., Pfister, L., Hopp, L. (2016): On the value of surface saturated area dynamics mapped with thermal infrared imagery for modeling the hillslope-riparian-stream continuum. *Water Resources Research*, 52 (10), 8317-8342.

[21] Martínez-Carreras, N., *Schwab, M., **Klaus, J.**, Hissler, C. (2016): In situ and high frequency monitoring of suspended sediment properties using a spectrophotometric sensor. *Hydrological Processes*, 30, 3533–3540.

[20] Jackson, C.R., Du, E., **Klaus, J.**, Griffiths, N.A, Bitew, M., McDonnell, J.J. (2016): An ensemble of interacting hydraulic conductivities and thresholds revealed by a multi-tracer hillslope irrigation experiment. *Water Resources Research*, 52 (8), 6186-6206.

[19] Van Schaik, L., Palm, J., **Klaus, J.,** Zehe, E., Schröder, B. (2016): Soil tillage influence on within-field earthworm abundance and distribution patterns. *Agriculture, Ecosystems and Environment*, 228, 82–90.

[18] Coles, A., Wetzel, C.E., Martinez-Carreras, N., Ector, L., McDonnell, J.J., Frentress, J., **Klaus, J.**, Hoffmann, L., Pfister, L. (2016): Diatoms as a tracer of hydrological connectivity: are they supply limited? *Ecohydrology*, 9, 631 – 645.

[17] Du, E., Jackson, C.R., **Klaus, J.**, McDonnell, J.J., Griffiths, N.A., Williamson, M.F., Greco, J.L., Bitew, M. (2016): Interflow dynamics on a low relief forested hillslope: lots of fill, little spill. *Journal of Hydrology*, 534: 648-658.

[16] Griffiths, N.A, Jackson, C.R., McDonnell, J.J., **Klaus, J.**, Du, E., Bitew, M. (2016): Dual nitrate isotopes clarify the role of biological processing and hydrologic flowpaths on nitrogen cycling in subtropical low-gradient watersheds. *Journal of Geophysical Research-Biogeosciences*, 121, 422 – 437.

[15] **Klaus, J.**, Wetzel, C., Martínez-Carreras, N., Ector, L., Pfister, L. (2015): A tracer to bridge the scales: Tracing the on- and offset of fast flowpath connectivity from headwater catchments to meso-scale basins using diatoms. *Hydrological Processes*, 29: 5275–5289.

[14] Pfister, L., Wetzel, C., Martínez-Carreras, N., Iffly, J.F., **Klaus, J.**, Holko, L., McDonnell, J.J. (2015): Examination of aerial diatom flushing across watersheds in Luxembourg, Oregon and Slovakia for tracing episodic hydrological connectivity. *Journal of Hydrology and Hydromechanics*, 63(3), 235-245.

[13] **Klaus, J.**, Chun, K.P, McGuire, K.J., McDonnell, J.J. (2015): Temporal dynamics of catchment transit times from stable isotope data. *Water Resources Research*, 51, 4208–4223, doi:10.1002/2014WR016247.

[12] **Klaus, J.**, Chun, K.P., and Stumpp, C. (2015): Temporal trends in $\delta^{18}O$ composition of precipitation in Germany: insights from time series modelling and trend analysis. *Hydrological Processes*, 29, 2668-2680.

[11] **Klaus, J.**, McDonnell, J.J., Jackson, C.R., Du, E., Griffiths, N.A. (2015): Where does streamwater come from in low-relief forested watersheds? A dual-isotope approach, *Hydrology Earth System Sciences*, 19, 125-135.

[10] Stumpp, C., **Klaus, J.**, and Stichler, W. (2014): Long-term data set analysis of stable isotopic composition in German precipitation. *Journal of Hydrology*, 517, 351-361.

[9] **Klaus, J.**, Zehe, E., Elsner, M., Palm, J., Schneider, D., Schröder, B., Steinbeiss, S., van Schaik, L., West, S. (2014). Controls of event-based pesticide leaching in natural soils: A systematic study based on replicated field scale irrigation experiments. *Journal of Hydrology*, 512, 528-539.

[8] Van Schaik, L., Palm, J., **Klaus, J.**, Zehe, E., Schröder, B. (2014): Linking spatial earthworm distribution to macropore number and effectivity. *Ecohydrology*, 7, 401-408, doi: 10.1002/eco.1358.

[7] Pangle, L. A., **Klaus, J.**, Berman, E. S. F., Gupta, M., McDonnell, J.J. (2013): A new multisource and high-frequency approach to measuring $\delta^{2}H$ and $\delta^{18}O$ in hydrological field studies. *Water Resources Research*, 49, 7797–7803.

[6] **Klaus, J.**, McDonnell, J.J. (2013): Hydrograph separation using stable isotopes: review and evaluation. *Journal of Hydrology*, 505, 47-64.

[5] **Klaus, J.**, Zehe, E., Elsner, M., Külls, C., McDonnell, J.J. (2013): Macropore flow of old water revisited: Experimental insights from a tile drained hillslope. *Hydrology and Earth System Sciences*, 17(1), 103-118.

[4] **Klaus, J.**, Zehe, E. (2011): A novel explicit approach to model bromide and pesticide transport in connected soil structures. *Hydrology and Earth System Sciences*, 15(7), 2127-2144.

[3] **Klaus, J.**, Zehe, E. (2010): Modelling rapid flow response of a tile drained field site using a 2D-physically based model: assessment of "equifinal" model setups. *Hydrological Processes*, 24, 1595-1609.

[2] **Klaus, J.**, Kuells, C., Dahan, O. (2008): Evaluating the recharge mechanism of the Lower Kuiseb Dune area using mixing cell modeling and residence time data. *Journal of Hydrology*, 358, 304-316.

[1] Burns, D.A., **Klaus, J.**, McHale, M.R. (2007): Recent Climate Trends and Implications for Water Resources in the Catskill Mountain Region, New York, USA. *Journal of Hydrology*, 336, 155-170.