JAMES W. KIRCHNER Current 20 December 2024

Professor Emeritus of the Physics of Environmental Systems, Dept. of Environmental System Sciences and Affiliated Professor, Dept. of Civil, Environmental, and Geomatic Engineering, Swiss Federal Institute of Technology (ETH), Zürich; Universitätstrasse 22, CH-8092 Zürich, Switzerland
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Former Director and Senior Scientist, Swiss Federal Research Institute WSL
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Goldman Distinguished Professor for the Physical Sciences, Emeritus, and Director Emeritus, Central Sierra Field Research Stations, University of California, Berkeley, CA 94720-4767
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Current research/teaching areas

Catchment hydrology and biogeochemistry
Geomorphology and Earth surface processes
Analysis of environmental data

Education

Ph.D. (energy and resources) 1990, University of California, Berkeley
M.S. (systems analysis) 1982, Dartmouth College, Thayer School of Engineering
B.A. (physics) and B.A. (philosophy) 1980, Dartmouth College

Previous positions held

Director, Swiss Federal Research Institute WSL, 2007-2012
University of California. Professor of Earth and Planetary Science, 2002-2010
Associate Professor, 1997-2002; Assistant Professor, 1991-1997;
Director, Central Sierra Field Research Stations 1997-2014.
California Institute of Technology. Bantrell Postdoctoral Fellow, 1990-1991

Honors

King Carl XVI Gustav Royal Professorship in Environmental Science, 2025-2026
Distinguished Visiting Professor, Dept. of Hydraulic Engineering, Tsinghua University, 2024-2027
Langbein Lecture (for lifetime contributions to hydrology), American Geophysical Union, 2016
lecture available online at https://youtu.be/PKjV2sfUN2E?t=1860
Bagnold Medal (for contributions to geomorphology), European Geosciences Union, 2013
Fellow, American Geophysical Union, 2008
Fellow, Centre for Ecology and Hydrology, U.K., 2010-2018
Honorary Professor, Institute of Applied Ecology, Chinese Academy of Sciences, 2011
Goldman Distinguished Professor for the Physical Sciences, UC Berkeley, 2003-2008
Miller Professor, Miller Institute for Basic Research, UC Berkeley, 2002-2003

Students trained (and their current positions)

Darryl E. Granger, Ph.D. 1996 (Full Professor, Purdue University)
Joshua J. Roering, Ph.D. 2000 (Full Professor, University of Oregon)
Clifford S. Riebe, Ph.D. 2000 (Full Professor, University of Wyoming)
Elisabeth R. Micheli, Ph.D. 2000 (President and CEO, Pepperwood Preserve)
Dyan Whyte, M.S. 2000 (California Regional Water Quality Control Board, retired)
Elowyn Yager, Ph.D. 2006 (Full Professor, University of Idaho)
Taylor Perron, Ph.D. 2006 (Full Professor, MIT; AGU Macelwane Medalist; MacArthur Fellow)
Sarah Godsey, Ph.D. 2009 (Associate Professor, Idaho State University)
Kenneth Ferrier, Ph.D. 2009 (Associate Professor, University of Wisconsin)
Andrea Rücker, Ph.D. 2019 (Consultant)

Nikos Theodoratos, Ph.D. 2020 (Principal Hydrologist, Meinhardt Group)
Minhui Li, Ph.D. 2024 (postdoc, Yale University)

Students co-supervised at the Swiss Federal Research Institute WSL

Sven Wirthner, Ph.D. 2011 (Dept. Head for Fish, Game, and Wildlife, Canton of Valais)
Jan Magnusson, Ph.D. 2012 (Snow Hydrologist, Institute for Snow and Avalanche Research SLF)
Manuel Nitsche, Ph.D. 2012 (Scientific Officer, Swiss Federal Office for the Environment)
Louis Bugnion, Ph.D. 2012 (Engineer, KAN-NAK S.A.)
Claudia Bieler, M.S. 2012 (Scientific Asst., Institute for Snow and Avalanche Research SLF)
Johannes Schneider, Ph.D. 2015 (Research Scientist, Ernst Mach Institute)
Florian Heimann, Ph.D. 2015 (Scientific Programmer)
Alexander Beer, Ph.D. 2015 (Postdoc, University of Tübingen)
Maarten Smoorenburg, Ph.D. 2015 (Hydrologist, Deltares)
Tobias Nicollier, Ph.D. 2022
Fabian Bernhard, Ph.D. 2024
Amanda Aaberg (current Ph.D. candidate)

Postdocs supervised (and their current positions)

Daniele Penna (Associate Professor, University of Florence)
Erfan Haghighi (Staff Scientist, Eawag)
Albrecht von Boetticher (Project Engineer, Staubli Kurath & Partner)
Scott Allen (Assistant Professor, University of Nevada)
Jeffrey Prancevic (Mendenhall Fellow, U.S. Geological Survey)
Jana von Freyberg (SNF *Prima* Assistant Professor, EPFL)
Julia Knapp (Assistant Professor, Durham University)
Wouter Berghuijs (Tenured Professor, Free U. of Amsterdam)
Elham Rouholahnejad Freund (Marie Curie fellow, University of Zürich)
Cansu Culha (NSF postdoc, University of British Columbia)
Hansjörg Seybold (staff scientist, ETH Zurich)
Sebastian Wolf (staff scientist, ETH Zurich)
Marius Floriancic (staff scientist, ETH Zurich)
Harsh Beria (staff scientist, MeteoSwiss and SLF)
Maria Grazia Zanoni (current postdoc)
Minhui Li (current postdoc)
Shaozhen Liu (current postdoc)
Huibin Gao (current postdoc)

Service as external examiner, advisor, or thesis committee member

Thomas M. Johnson (Ph.D., Berkeley, 1995), Mariza Costa Cabral (Ph.D., University of Washington, 1997), Raymond Torres (Ph.D., Berkeley, 1998), Sean E. McCauley (Ph.D., Berkeley, 1998), Patricia Seifert (Ph.D., Berkeley, 1998), Karin P. Shen (Ph.D., Berkeley, 1998), Teri Balser (Ph.D., Berkeley, 2000), Susan Taylor (Ph.D., Dartmouth College, 2001), Christina Tonitto (Ph.D., Berkeley, 2002), Leonard Sklar (Ph.D., Berkeley, 2003), Alavanja Christianne Ridge (Ph.D., Berkeley, 2004), Susana Bernal Berenguer (Ph.D., Barcelona, 2006), Asmeret Berhe (Ph.D., Berkeley, 2006), Trygve Lundquist (Ph.D., Berkeley, 2006), Sarah Reed (Ph.D., Berkeley, 2007), Nicole Vaillant (Ph.D., Berkeley, 2008), Joachim Rozemeijer (Ph.D., Utrecht, 2010), Robert Krier (Ph.D., Delft, 2012), Alice Aubert (Ph.D., Rennes, 2013), Florian Kobierska-Baffie (Ph.D., ETH, 2014), Marko Adamovic (Ph.D., Grenoble, 2014), Paolo Benettin (Ph.D., Padua, 2015), Nina Volze (Ph.D., ETH, 2015), Paul Richardson (Ph.D., MIT, 2015), Louise Slater (Ph.D., University of St. Andrews, 2015), Paul Floury (Ph.D., University of the Sarbonne, 2017), Marialaura Bancheri (Ph.D., Trento, 2017), Matthias Speich (Ph.D., ETH, 2018), Bianca Saladin (Ph.D., ETH, 2020), Nafe Moradkhani (Ph.D., IMT Mines Albi, 2023), Qin Liu (Ph.D., Tianjin University, 2023), Huibin Gao (Ph.D., Hohai University 2023), Amrit Prasad Sharma (Ph.D., Tsinghua University, 2024), Durgesh Kumar Singh (Ph.D., Tsinghua University, 2024), Minhui Li (Ph.D., Tsinghua University, 2024), Shaozhen Liu (Ph.D., Beijing Normal University, 2024), Zhuoyi Tu (Ph.D., Tsinghua University, 2024).

Research grants (partial list)

2022-2024 A Data-Driven approach to estimate watershed responses, Swiss Data Science Center, CHF 93,000 (co-PI with 2 others)
2016-2023 Spatio-temporal patterns in water isotopes in Swiss forests and forest soils, Swiss Federal Office of the Environment, CHF 193,000 (PI)
2007-2012 / 2013-2018 Critical Zone Observatory: Snowline processes in the southern Sierra Nevada, National Science Foundation, $8,500,000 (co-PI with 7 others)
2006-2009 Keck hydro-watch center at U.C. Berkeley, W.M. Keck Foundation, $1,600,000 (co-PI with 5 others)

Community service (partial list)

Director, Swiss Federal Institute for Forest, Snow, and Landscape Research (WSL), the largest environmental research institute in Switzerland, with a staff of ~550 (2007-2012)
Panel chair, panel member and shadow panel member, ERC Starting, Consolidator, and Advanced Grants, European Research Council (2015-2023)
Panel chair, National Evaluation of Natural Sciences in Norway, Norwegian Research Council, 2022-2024
International jury chairman, "1,000 Ideas Programme", Austrian Science Fund (FWF), 2020-present
Originator and convener of the Berkeley Catchment Science Symposium, an international interdisciplinary meeting held annually in Berkeley immediately before AGU (2006-present)
Director of UC Berkeley's Central Sierra Field Research Stations, a research and educational network of field stations and natural reserves comprising over 100 km^2 of high Sierra forests (1997-2014)
Member, standing committee on scientific integrity, ETH Zurich (2024-2028)
Member, board of trustees (in German: "Kuratorium"), Forest Research Institute (FVA) of Baden-Württemberg (2010-2017)
Senate Commission for Earth and Environment, Helmholtz Association (2017-present)
Review panel member, Helmholtz Distinguished Professorship Program (2021-present)
Review panel member, Geosystems Program, Helmholtz Association (2013)
Editorial board member, *Earth Surface Processes and Landforms*
Editorial board member, *Hydrological Processes*
Editor's Award for reviewing, American Meteorological Society (2014)
AGU Langbein Lecture committee member (2017-2019) and chair (2019)
EGU Bagnold Medal committee member (2013-2017)
Member, NRC Panel on Earth Science and Applications from Space (Panel on Solid-Earth Hazards, Resources, and Dynamics)
Author, "Data analysis toolkits", public web resources for research and education
Data quality control leader of the Plynlimon hydrochemistry study, through which decades of stream chemistry time series have been made publicly available

Departmental service at UC Berkeley, Department of Earth and Planetary Science

Head graduate advisor
Undergraduate advisor

Departmental service at ETH Zurich, Department of Environmental Systems Sciences

Chair (2018-2023) and deputy chair (2016-2017), Institute of Terrestrial Ecosystems
Member, strategic planning committee, 2016-2023
Member, resource commission, 2018-2023
Member, department executive committee, 2018-2023
Member, transdisciplinary lab advisory committee, 2016-2024

Significant scientific contributions (with manuscript numbers keyed to publication list below)

In hydrology:

Showed that *stream networks dynamically extend and retract*, and connect and disconnect, as landscapes wet up and dry out, and that this behavior can be predicted from topographic curvature (with Sarah Godsey, Jeff Prancevic, and Ilja van Meerveld; 119, 164, 178).

Discovered that *stream chemistry time series exhibit fractal power spectra*, which implies that *catchment transport is highly dispersive, travel time distributions are strongly skewed, and water quality trends are difficult to predict* (with Colin Neal and Xiahong Feng; 38, 50, 63, 68, 69, 91, 92, 93, 112, 116, 124, 221).

Showed that globally, *groundwater losses are accelerating*, and across much of the United States, *groundwater pumping has lowered water tables below adjacent streams*, implying widespread potential loss of streamflow into underlying aquifers (with Scott Jasechko, Debra Perrone, Hansjörg Seybold, and Ying Fan; 200, 225).

Showed that *aquifers are typically much older than the rivers that drain them*, as a result of aquifer heterogeneity (with Scott Jasechko and Wouter Berghuijs; 131, 145, 147).

Showed that *catchments often behave as chemostats*, regulating streamwater concentrations within relatively narrow bounds as stream discharge changes by orders of magnitude, on both event and inter-annual time scales (with Sarah Godsey; 88, 161).

Developed *ensemble rainfall-runoff analysis* (ERRA), a data-based, model-independent, nonparametric method for quantifying nonlinearity, nonstationarity, and spatial heterogeneity in the coupling between precipitation and streamflow (210, 235, 240).

Developed *ensemble hydrograph separation* methods for *measuring and analyzing the high-frequency isotopic dynamics of precipitation and streamflow*, thus revealing the transit time distributions of landscapes (with Jana von Freyberg, Julia Knapp, and Bjørn Studer; 143, 159, 160, 177, 196)

Developed methods for measuring the *young water fraction* (the fraction of streamflow less than 2-3 months old) from seasonal isotopic cycles in rainfall and streamflow (129, 130, 131, 155, 181).

Developed *end-member splitting analysis*, which quantifies how precipitation is partitioned among different fates, such as summer streamflow, winter streamflow, and evapotranspiration (180).

Developed the *simple dynamical systems* approach for "doing hydrology backward", inferring how landscapes store and release water based on their time-series behavior (86, 94, 107, 125).

Developed simple, testable geochemical methods for *predicting how acid rain will affect lakes and streams* on both event and decadal time scales (14, 15, 16, 17, 22, 24).

In geomorphology and geochemistry:

Pioneered *cosmogenic radionuclide methods* for measuring long-term rates of physical erosion and chemical weathering at the catchment scale (with Darryl Granger, Cliff Riebe, and Ken Ferrier; 25, 26, 40, 41, 42, 43, 46, 64, 65, 71, 75, 84, 96, 97, 106).

Demonstrated that *landscapes are not fractal*, but instead exhibit characteristic (and predictable) scales of valley dissection (with Taylor Perron, Bill Dietrich, and Nikos Theodoratos; 83, 85, 89, 204).

Showed that river longitudinal profile concavity is primarily controlled by tectonic forcing rather than climate (with Hansjörg Seybold, Wouter Berghuijs, and Jeff Prancevic: 199).

Showed that *branching angles of valley networks reflect climatic aridity*, and that Mars' valley networks were probably formed under arid conditions (with Hansjörg Seybold; 142, 154).

Demonstrated that *hillslopes in soil-mantled landscapes are not parabolic*, implying that *soil creep is a strongly nonlinear function of hillslope gradient* (with Josh Roering and Bill Dietrich; 29, 44, 45, 54, 73, 80).

Showed that *stress partitioning by large woody debris* (and other roughness elements) is an important control on sediment mobility in steep mountain streams (with Elowyn Yager, Bill Dietrich, Manuel Nitsche, Johannes Schneider, Dieter Rickenmann, and Michael Manga; 39, 78, 99, 102, 103, 108, 117, 120, 121, 126, 127, 135).

Showed that "Horton's Laws", which had long been interpreted as revealing deep universal principles of drainage network organization, *are instead largely artifacts of the way that stream order is defined* (18, 19, 20).

In ecology and evolutionary biology:

Showed that the marine invertebrate fossil record implies a roughly *10-million-year lag* between extinction events and subsequent increases in diversity through diversification of new groups of organisms. This led to the hypothesis, subsequently confirmed by others, that *extinction does not vacate ecological niches but rather collapses them*; thus rates of diversification are suppressed, not enhanced, in post-extinction ecosystems (with Anne Weil; 28, 33, 34, 52, 59, 167).

Showed that host traits for pathogen resistance and pathogen tolerance *have fundamentally different evolutionary dynamics* (with Bitty Roy; 30, 31, 32, 51, 56).

Authored the *geophysical critique of the Gaia Hypothesis* (7, 8, 12, 23, 55, 62).

Citation metrics

ISI/Web of Science	total citations: 21,045	h-index: 77
Scopus	total citations: 22,270	h-index: 79
Google Scholar	total citations: 31,873	h-index: 91
ORCID 0000-0001-6577-3619	ResearcherID B-6126-2009	

Submitted manuscripts (underscore=thesis or postdoc research supervised by Kirchner)

248. Popp, A.L., H. Beria, M. Sprenger, P. Ala-Aho, M. Coenders-Gerrits, J. Groh, J. Klaus, J. Knapp, G. Koren, I. Bakiri, E.X. Fei, M. Gillon, C. Harman, C. Hissler, T. Holmes, G. Jeelani, A. Kalvans, A. Montemagno, E.Z. Öztürk, P.Z. Rozic, T. Stadnyk, I. van Meerveld, D. Penna, P. Vreca, G. Zuecco, and **J.W. Kirchner**, Recent advances in tracer-aided mixing modeling of Critical Zone water fluxes, *Reviews of Geophysics*, in review.

247. Beria, H., A. Shekhar, V. Trotsiuk, S. Klesse, H. Seybold, M.G. Floriancic, S. Wolf, X. Li, J. Xiao, A. Gessler, N. Buchmann, and **J.W. Kirchner**, Unraveling effects of droughts on forest productivity along an elevation gradient in Switzerland, *Geophysical Research Letters*, in review.

246. Floriancic, M.G., G.R. Goldsmith, H. Beria, S.T. Allen, and **J.W. Kirchner**, Limited soil water recharge in summer affects seasonal isotopic signatures of tree xylem water, *Ecohydrology*, in review.

245. Reek, J., G. Smith, C. Zohner, S. Cook-Patton, P. De Frenne, P. D'Odorico, M.G. Floriancic, R. Jackson, J. Jones, **J.W. Kirchner**, M. Lague, Y. Liang, Y. Masuda, R. McDonald, L Parsons, B. Probst, J. Spector, T. West, N. Wolff, F. Zellweger, and T. Crowther, The role of forests in global climate adaptation, *Science*, in review.

244. Knapp, J.L.A., W.R. Berghuijs, M.G. Floriancic, and **J.W. Kirchner**, Catchment hydrological response and transport are affected differently by precipitation intensity and antecedent wetness, *Hydrology and Earth System Sciences*, in review.

243. Liu, S., H. Seybold, I. van Meerveld, Y. Wang, and **J.W. Kirchner**, Tree planting attenuates storm runoff response on the Chinese Loess Plateau, *Communications Earth & Environment*, in review.

242. Li, M., H. Seybold, X. Fu, B. Wu, and **J.W. Kirchner**, Climatic controls on stream network topology, *Geophysical Research Letters*, in review.

241. Prancevic, J., H.J. Seybold, and **J.W. Kirchner**, Variability of flowing stream network length across the U.S., as shaped by topography and climate, *Science*, in review.

Refereed publications (underscore=thesis or postdoc research supervised by Kirchner)

N.B. These are classified by 3-letter codes according to the general fields to which they belong:

H2O *Catchment hydrology and geochemistry*
GEO *Geomorphology and Earth surface processes*
ECO *Evolution and ecology*
OTH *All other topics*

N.B. the ordering of the author lists for these publications may reflect either the common European approach (in which the project leader is often listed last), or the common American approach (in which the authors are listed in decreasing order of significance).

N.B. papers are reported as "ISI highly cited" if they were designated as ISI highly cited papers at any time since publication. Some of these no longer appear on the current ISI highly cited list due to variations in citation thresholds for that list over time.

240. (H2O) Gao, H., Q. Ju, D. Zhang, Z. Wang, Z. Hao, and **J.W. Kirchner**, Quantifying dynamic linkages between precipitation, groundwater recharge, and streamflow using Ensemble Rainfall-Runoff Analysis, *Water Resources Research*, 60, e2024WR037821, https://doi.org/10.1029/2024WR037821, 2024.

239. (GEO) Åberg, A., **J.W. Kirchner**, B. McArdell, T. de Haas, J. Hirschberg, and J. Aaron, Field validation of the superelevation method for debris flow velocity estimation using high-resolution LiDAR and UAV data, *Journal of Geophysical Research – Earth Surface*, 129, e2024JF007857, https://doi.org/10.1029/2024JF007857, 2024.

238. (H2O) Wang, J., X. Li, Y. Li, Y. Shi, H. Xiao, L. Wang, W. Yin, Z. Zhu, H. Bian, H. Li, Z. Shi, H. Seybold, and **J.W. Kirchner**, Transport pathways of nitrate in stormwater runoff inferred from high-frequency sampling and stable water isotopes, *Environmental Science and Technology*, 58, 17026-17035, https://doi.org/10.1021/acs.est.4c02495, 2024.

237. (H2O) Floriancic, M.G., S.T. Allen, and **J.W. Kirchner**, Young and new water fractions in soil and hillslope waters, *Hydrology and Earth System Sciences*, 28, 4295-4308, https://doi.org/10.5194/hess-28-4295-2024, 2024. (*HESS highlight paper*)

236. (OTH) Baalmann, L.R., S. Hunziker, A. Peronne, **J.W. Kirchner**, K.-H. Glassmeier, D.M. Malaspina, L.B. Wilson III, C. Strähl, S. Chadda, and V.J. Sterken, A solar rotation signature in cosmic dust I: frequency analysis of dust particle impacts on the Wind spacecraft, *Astronomy & Astrophysics*, 689, A329, https://doi.org/10.1051/0004-6361/202450069, 2024.

235. (H2O) **Kirchner, J.W.**, Characterizing nonlinear, nonstationary, and heterogeneous hydrologic behavior using ensemble rainfall-runoff analysis (ERRA): proof of concept, *Hydrology and Earth System Sciences*, 28, 4427-4454, https://doi.org/10.5194/hess-28-4427-2024, 2024. (*HESS highlight paper*)

234. (H2O) Floriancic, M.G., M.P. Stockinger, **J.W. Kirchner**, and C. Stumpp, Monthly new water fractions and their relationships to climate and catchment properties across Alpine rivers, *Hydrology and Earth System Sciences*, 28, 3675-3694, https://doi.org/10.5194/hess-28-3675-2024, 2024.

233. (H2O) Scandellari, F. T. Attou, A. Barbeta, F. Bernhard, C. D'Amato, K. Dimitrova-Petrova, A. Donaldson, O. Durodola, S. Ferraris, M.G. Florancic, G. Fontenla-Razzetto, M. Gerchow, Q. Han, I. Khalil, **J.W. Kirchner**, K. Kühnhammer, Q. Liu, P. Lorens, R.-K. Magh, J. Marshall, K. Meusburger, A. M. Olivera, L.M. Villers, S.S. Pires, D. Todini-Zincavo, I. van Meerveld, C. Voight, L. Wirsig, M. Beyer, J. Geris, L. Hopp, D. Penna, and M. Sprenger, Using stable isotopes to inform water resource management in forested and agricultural ecosystems, *Journal of Environmental Management*, 365, 121381, https://doi.org/10.1016/j.jenvman.2024.121381, 2024.

232. (H2O) Knapp, J.L.A., T. Napitupulu, J. von Freyberg, A. Rücker, B. Studer, M. Zappa, and **J.W. Kirchner**, Multi-year time series of daily solute and isotope measurements from three Swiss pre-Alpine catchments, *Nature Scientific Data*, 11, 393, https://doi.org/10.1038/s41597-024-03192-5, 2024.

231. (GEO) Li, M., H. Seybold, B. Wu, Y. Chen, X. Fu, and **J.W. Kirchner**, Topographic and climatic controls on global patterns in drainage basin shape, *Geophysical Research Letters*, http://dx.doi.org/10.1029/2023GL105804, 2024.

230. (H2O) Floriancic, M.G., S.T. Allen, and **J.W. Kirchner**, Isotopic evidence for seasonal water sources in tree xylem and forest soils, *Ecohydrology*, e2641, https://doi.org/10.1002/eco.2641, 2024.

229. (H2O) Floriancic, M.G. and **J.W. Kirchner**, Isotopic offsets in throughfall and stemflow may have small effects on estimates of winter precipitation fractions, *Hydrological Processes*, 38, e15095, http://dx.doi.org/10.1002/hyp.15095, 2024. (*selected for Editor's Choice Collection in Hydrological Processes*)

228. (H2O) Bernhard, F., M.G. Floriancic, K. Treydte, A. Gessler, **J.W. Kirchner**, and K. Meusburger, Tree- and stand-scale variability of xylem water stable isotope signatures in mature beech, oak, and spruce, *Ecohydrology*, http://dx.doi.org/10.1002/eco.2614, 2024.

227. (H2O) Huang, Y., J. Evaristo, Z. Li, K.P. Chun, E.H. Sutanudjaja, M.B. Cardenas, M.F.P. Bierkens, **J.W. Kirchner**, and M.T. van Genuchten, The nature and extent of bomb tritium remaining in vadose zones: a synthesis and prognosis, *Vadose Zone Journal*, 23, 4, e20304, http://doi.org/10.1002/vzj2.20304, 2024.

226. (GEO) Novak, M., C. Holmden, A.V. Andronikov, Y.V. Erban Kochergina, **J.W. Kirchner**, T. Paces, V. Kachlik, F. Veselovsky, J. Hruška, F. Laufek, M. Koubova, M. Stepanova, E. Prechova, O. Sebek, J. Curik, M. Tesar, D. Fottova, I.E. Andronikova, and A. Komarek, Mg, Ca and Sr isotope dynamics in a small forested catchment underlain by paragneiss: The role of geogenic, atmospheric, and biogenic sources of base cations, *Geoderma*, https://doi.org/10.1016/j.geoderma.2023.116768, 2024.

225. (H2O) Jasechko, S., H. Seybold, D. Perron, Y. Fan, M. Shamsuddha, R.G. Taylor, O. Fallatah, and **J.W. Kirchner**, Rapid groundwater decline and some cases of recovery in aquifers globally, *Nature*, 625, 715-721, https://doi.org/10.1038/s41586-023-06879-8, 2024.

224. (H2O) Liu, S., I. van Meerveld, Y. Zhao, Y. Wang, and **J.W. Kirchner**, Seasonal dynamics and spatial patterns of soil moisture in a loess catchment, *Hydrology and Earth System Sciences,* https://doi.org/10.5194/hess-28-205-2024, 2024.

223. (H2O) Wolf, S., E. Paul-Limoges, D. Sayler, and **J.W. Kirchner**, Dynamics of evapotranspiration from concurrent above- and below-canopy flux measurements in a montane Sierra Nevada forest, *Agricultural and Forest Meteorology*, 346, 109864, https://doi.org/10.1016/j.agrformet.2023.109864, 2023.

222. (GEO) Rouholahnejad Freund, E., H. Seybold, S. Jasechko, and **J.W. Kirchner**, Groundwater's fingerprint in stream network branching angles, *Geophysical Research Letters*, 50, e2023GL103599, https://doi.org/10.1029/2023GL103599, 2023.

221. (H2O) Dentz, M., **J.W. Kirchner**, E. Zehe, and B. Berkowitz, The role of anomalous transport in long-term stream water chemistry variability, *Geophysical Research Letters*, 50, e2023GL104207, https://doi.org/10.1029/2023GL104207, 2023.

220. (H2O) **Kirchner, J.W.**, Mixing models with multiple, overlapping, or incomplete end-members, quantified using time series of a single tracer, *Geophysical Research Letters*, 50, e2023GL104147, https://doi.org/10.1029/2023GL104147, 2023.

219. (GEO) Li, M., H. Seybold, B. Wu, Y. Chen, and **J.W. Kirchner**, Interaction between tectonics and climate encoded in the planform geometry of stream networks on the eastern Tibetan Plateau, *Geophysical Research Letters*, 50, e2023GL104121, https://doi.org/10.1029/2023GL104121, 2023.

218. (H2O) **Kirchner, J.W.**, P. Benettin, and H.J. van Meerveld, Instructive surprises in the hydrological functioning of landscapes, *Annual Review of Earth and Planetary Sciences*, 51, 277-299, https://doi.org/10.1146/annurev-earth-071822-100356, 2023.

217. (H2O) Bieroza, M., S. Acharya, J. Benisch, R.N. ter Borg, L. Hallberg, C. Negri, A. Pruitt, M. Pucher, F. Saavedra, K. Staniszewska, S. van't Veen, A. Vincent, C. Winter, N.B. Basu, H,P. Jarvie, and **J.W. Kirchner**, Advances in catchment science, hydrochemistry and aquatic ecology enabled by high-frequency water quality measurements, *Environmental Science and Technology*, https://doi.org/10.1021/acs.est.2c07798, 2023.

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175. Li, L., W. Zhi, B. Stewart, H. Wen, D. Xiao, H.R. Bernard, **J.W. Kirchner**, J.N. Perdrial, J.B. Shanley, and K.H. Williams, The shallow and deep hypothesis: linking flow paths, biogeochemical reactions, and stream chemistry in the Critical Zone, Invited presentation, *American Geophysical Union Fall Meeting*, New Orleans, December 2021.

174. Stähli, M., I.H.J. van Meerveld, **J.W. Kirchner**, J. Seibert, and J. von Freyberg, What makes this catchment so dynamic? Lessons learned in the Alptal, central Switzerland, during summer floods of 2021, Invited presentation, *American Geophysical Union Fall Meeting*, New Orleans, December 2021.

173. Knapp, J.L.A., J. von Freyberg, and **J.W. Kirchner**, Solute delivery as a function of catchment conditions across timescales, *Invited presentation, 31st international V.M. Goldschmidt Conference*, https://doi.org/10.7185/gold2021.6075, June 2021.

172. **Kirchner, J.W.,** Exploring mechanisms and timescales of transport and hydrological response, using high-frequency chemical, isotopic, and hydrometric time series, Invited keynote presentation, *4th International Workshop on High-Resolution Water Quality Monitoring and Analysis*, Uppsala, Sweden (online), May 2021.

171. **Kirchner, J.W.,** Quantifying catchments' nonlinear hydrologic response and solute transport behavior using ensemble unit hydrographs and ensemble hydrograph separation, Invited presentation, *American Geophysical Union Fall Meeting*, Online, December 2020.

170. Knapp, J.L.A., J. von Freyberg, B. Studer, L. Kiewiet, and **J.W. Kirchner**, Concentration-discharge relationships vary among hydrological events, reflecting differences in event characteristics, *Invited presentation, European Geosciences Union General Assembly*, Online, https://doi.org/10.5194/egusphere-egu2020-5981, May 2020.

169. Jasechko, S., H.J. Seybold, D. Perron, Y. Fan, and **J.W. Kirchner**, Continental-scale hydraulic gradients, *Invited presentation, American Geophysical Union Fall Meeting*, San Francisco, December 2019.

168. Dawson, T., J. von Freyberg, E. Oerter, D. Rempe, and **J.W. Kirchner**, *Utilizing high-resolution isotope data to advance catchment-scale questions in novel ways: opportunities and challenges.* Invited presentation, Gordon Research Conference on Catchment Science, Andover, NH, June 2019.

167. **Kirchner, J.W.**, Quantifying timescales of catchment storage, transport and hydrological response using ensemble hydrograph separation and ensemble unit hydrographs. *Invited presentation, European Geosciences Union General Assembly*, Vienna, April 2019.

165. Prancevic, J.P., J.T. Perron, and **J.W. Kirchner**, Potential effects of topographic stresses on the emergence of streamflow (and vice versa), *Invited Presentation, European Geosciences Union General Assembly*, Vienna, April 2019.

165. **Kirchner, J.W.**, Exploring landscapes and ecosystems by studying their streams. *Distinguished Scientist Seminar Series, Lawrence Berkeley National Laboratory*, March 2019.

164. **Kirchner, J.W.**, Exploring landscapes and ecosystems by studying their streams. *Luxembourg Academy of Sciences*, January 2019.

163. **Kirchner, J.W.**, High-frequency chemical and isotopic dynamics from "lab in the field" measurements. *University of Tübingen*, January 2019.

162. **Kirchner, J.W.**, Measuring timescales of catchment transport and hydrological response using ensemble unit hydrographs and ensemble hydrograph separation. *German Research Centre for Earth Sciences (GFZ), Potsdam*, January 2019.

161. **Kirchner, J.W.**, Exploring landscapes and ecosystems by studying their streams. *German Research Centre for Earth Sciences (GFZ), Potsdam*, January 2019.

160. Prancevic, J. and **J.W. Kirchner**, Topographic controls on the expansion and contraction of stream networks. *Invited presentation, American Geophysical Union Fall Meeting*, Washington, December 2018.

159. **Kirchner, J.W.**, Catchment storage, chemical dynamics, and hydrological response, on timescales from minutes to months. *École polytechnique fédérale de Lausanne (EPFL)*, October 2018.

158. **Kirchner, J.W.**, Timescales of catchment transport and hydrological response. *Russian Academy of Sciences*, Moscow, October 2018.

157. **Kirchner, J.W.**, Exploring landscapes and ecosystems by studying their streams. *University of Lausanne*, May 2018.

156. **Kirchner, J.W.**, Hydrological and geochemical coevolution of landscapes and their streams. Invited presentation, *Invited presentation, European Geosciences Union General Assembly*, Vienna, April 2017.

155. Prancevic, J., **J.W. Kirchner**, and M.P. Lamb, Exploring the sensitivity of landslide erosion rate to local topographic gradient. *Invited presentation, American Geophysical Union Fall Meeting,* New Orleans, December 2017.

154. Rouholahnejad, E., and **J.W. Kirchner**, The effects of spatial heterogeneity and subsurface lateral transfer on evapotranspiration estimates in large scale Earth system models. *Invited presentation, American Geophysical Union Fall Meeting,* New Orleans, December 2017.

153. **Kirchner, J.W.**, Catchment storage and transport on timescales from minutes to millennia. *Invited presentation, American Geophysical Union Fall Meeting,* New Orleans, December 2017.

152. **Kirchner, J.W.**, Science, policy, and rationality in a partisan era, *Invited presentation, American Geophysical Union Fall Meeting,* New Orleans, December 2017.

151. **Kirchner, J.W.**, Catchment storage and transport on timescales from minutes to months, traced by stable water isotopes. *Invited keynote address, EGU Leonardo Conference on Water Stable Isotopes in the Hydrological Cycle,* Black Forest, Germany, October 2017.

150. **Kirchner, J.W.**, Dynamics of water age and streamflow chemistry, from minutes to millennia. *Invited keynote address, 9th BIOGEOMON Symposium on Ecosystem Behavior*, Litomysl, Czech Republic, August 2017.

149. **Kirchner, J.W.**, Shouts and whispers from an evolving world: what can environmental seismology tell us about the processes that shape Earth's surface? *Invited keynote address, EGU Galileo Conference on Environmental Seismology*, Ohlstadt, Germany, June 2017.

148. **Kirchner, J.W.**, Testing hypotheses of velocity and celerity at the catchment scale using ensemble hydrograph separation. *Invited presentation, European Geosciences Union General Assembly*, Vienna, April 2017.

147. **Kirchner, J.W.** and L. Pfister, Hypothesis testing in hydrology: theory and practice. *Invited presentation, European Geosciences Union General Assembly*, Vienna, April 2017.

146. Godsey, S. and **J.W. Kirchner**, Catchment chemostasis revisited: water quality responds differently to variations in weather and climate. *Invited presentation, European Geosciences Union General Assembly*, Vienna, April 2017.

145. **Kirchner, J.W.**, Quantifying new water fractions and water age distributions using ensemble hydrograph separation. *Invited presentation, European Geosciences Union General Assembly*, Vienna, April 2017.

144. **Kirchner, J.W.**, Exploring landscapes and ecosystems by studying their streams. *Langbein Lecture, American Geophysical Union Fall Meeting,* San Francisco, December 2016.

143. **Kirchner, J.W.**, The pulse of a montane ecosystem: coupled diurnal cycles in solar flux, snowmelt, evapotranspiration, groundwater, and streamflow at Sagehen Creek (Sierra Nevada, California). *Invited presentation, American Geophysical Union Fall Meeting,* San Francisco, December 2016.

142. **Kirchner, J.W.**, Quantifying new water fractions and water age distributions using ensemble hydrograph separation. *Invited presentation, American Geophysical Union Fall Meeting,* San Francisco, December 2016.

141. Seybold, H.F., D. Rothman, and **J.W. Kirchner**, The role of surface water for the branching geometry of Mars' channel networks. *Invited presentation, American Geophysical Union Fall Meeting,* San Francisco, December 2016.

140. Godsey, S.E., **J.W. Kirchner**, and J.A. Whiting, Ecohydrological and subsurface controls on drought-induced contraction and disconnection of stream networks. *Invited presentation, American Geophysical Union Fall Meeting,* San Francisco, December 2016.

139. **Kirchner, J.W.**, Isotopic indicators of water ages, from minutes to millennia, in groundwater and streamflow. *Invited keynote presentation, CUAHSI Biennial Symposium*, Shepherdstown, WV, July 2016.

138. **Kirchner, J.W.**, Hydrologic and water quality dynamics, from minutes to millennia, in groundwater and streamflow. *University of Aberdeen*, May 2016.

137. **Kirchner, J.W.**, Models as tools for confronting theory with data. *Invited keynote address, International workshop on improving the theoretical underpinnings of hydrologic models,* Bertinoro, Italy, April 2016.

136. **Kirchner, J.W.**, The pulse of a montane ecosystem: coupled diurnal cycles in solar flux, snowmelt, evapotranspiration, groundwater, and streamflow at Sagehen Creek, Sierra Nevada, California. *Invited presentation, European Geosciences Union General Assembly*, Vienna, April 2016.

135. **Kirchner, J.W.**, Hydrological and hydrochemical dynamics, on timescales from minutes to millennial *Invited keynote address, Water Research Symposium Baden-Württemberg*, January 2016.

134. **Kirchner, J.W.**, A. Beer, F. Heimann, D. Rickenmann, J. Schneider, A. von Boetticher, and J. Turowski, Flow, sediment transport, and erosion in steep mountain channels: an Alpine symphony. *Invited presentation, American Geophysical Union Fall Meeting,* San Francisco, December 2015.

133. **Kirchner, J.W.** and S. Jasechko, Isotopic indicators of threshold water ages, from months to millennia, in groundwater and streamflow. *Uppsala University*, October 2015.

132. **Kirchner, J.W.**, Hydrologic insights and observational challenges for land surface modeling. *Invited presentation, International workshop on improving hydrology in Earth system models,* Boulder, CO, October 2015.

131. **Kirchner, J.W.**, Environmental networks in steep terrain. *Invited keynote presentation, International Workshop on Global Networks of Mountain Observatories*, Gothic, CO, September 2015.

130. **Kirchner, J.W.** and C.S. Riebe, Chemical weathering rates viewed from the twin perspectives of soils and surface waters. *Invited keynote presentation, 25th international V.M. Goldschmidt Conference,* Prague, August 2015.

129. **Kirchner, J.W.** and S. Jasechko, Isotopic indicators of threshold water ages, from months to millennia, in groundwater and streamflow. *Invited keynote presentation, Gordon Research Conference on Catchment Science,* Andover, NH, June 2015.

128. Botter, G., P. Benettin, K. McGuire, **J.W. Kirchner**, and A. Rinaldo, Modeling river hydrochemistry through dynamic travel time distributions. *Invited presentation, European Geosciences Union General Assembly,* Vienna, April 2015.

127. **Kirchner, J.W.,** Prospects and pitfalls in the coming wave of high-frequency environmental data: What to look forward to, and watch out for. *Invited presentation, American Geophysical Union Fall Meeting,* San Francisco, December 2014.

126. Benettin, P., **J.W. Kirchner**, K.J. McGuire, A. Rinaldo, and G. Botter, Linking tracers and travel time distributions: the emergence of age mixing patterns. *Invited presentation, American Geophysical Union Fall Meeting,* San Francisco, December 2014.

125. **Kirchner, J.W.**, Legacy effects of the critical zone: dispersive transport at the hillslope scale, catchment travel-time distributions, non-self-averaging, and their implications for water quality trend detection. *Invited presentation, CUAHSI biennial symposium,* Shepherdstown, WV, July 2014.

124. **Kirchner, J.W.**, Water quality on time scales from hours to decades: diurnal cycles, fractal spectra, non-self-averaging, and challenges for trend detection. *Invited presentation, Workshop on high-resolution water quality monitoring, Helmholtz Centre for Environmental Research UFZ*, Magdeburg, July 2014.

123. Willenbring, J., A.T. Codilean, **J.W. Kirchner,** and B.J. McElroy, Earth is (mostly) flat: Apportionment of continental mass flux over millennial time scales – A reappraisal. *Invited presentation, American Geophysical Union Fall Meeting,* San Francisco, December 2013.

122. **Kirchner, J.W.**, Trends, seasonality, daily cycles, and fractal structures in water quality: from hours to decades, and H^+ to U. *University of Rennes*, October 2013.

121. **Kirchner, J.W.**, Universal fractal scaling in stream chemistry and its implications for solute transport and water quality trend detection. *Invited presentation, AGU Chapman Conference on soil-mediated drivers of coupled biogeochemical and hydrological processes, Biosphere II, Tucson, Arizona*, October, 2013

120. **Kirchner, J.W.**, Exploring environmental systems by studying their streams. *Idaho State University*, October, 2013.

119. **Kirchner, J.W.**, The physics and chemistry of Earth's dynamic surface. *Bagnold Medal lecture, European Geosciences Union General Assembly,* Vienna, April 2013.

118. **Kirchner, J.W.**, S. Weber, A. Schlumpf, and C. Neal, Isotopic and chemical tracers of hydrologic pathways and residence times at Plynlimon, Wales: from deuterium to uranium, and hours to decades. *Invited presentation, American Geophysical Union Fall Meeting,* San Francisco, December 2012.

117. **Kirchner, J.W.** and C. Neal, Spectral signatures of water quality from H^+ to U: implications for trend analysis and change detection on timescales from days to decades. *Invited presentation, American Geophysical Union Fall Meeting,* San Francisco, December 2012.

116. **Kirchner, J.W.** and C. Neal, Spectral signatures of water quality from H+ to U: implications for trend analysis and change detection on time scales from days to decades. *Invited presentation, IAHS Symposium on Prediction in Ungauged Basins, Delft*, October 2012.

115. **Kirchner, J.W.** and C. Neal, Stream chemistry dynamics from H^+ to U, and on timescales from hours to decades: implications for process understanding and environmental monitoring. *Invited presentation, Northwatch Workshop, Potsdam*, May 2012.

114. **Kirchner, J.W.**, Pitfalls, statistical and otherwise, in analysis of environmental data. *Invited Workshop, European Geosciences Union General Assembly, Vienna*, April 2012.

113. **Kirchner, J.W.** and C. Neal, Exploring hydrology and geochemistry through chemical dynamics in headwater streams: from H^+ to U, and hours to decades. *Institut de Physique du Globe de Paris,* February 2012.

112. **Kirchner, J.W.** and C. Neal, Everything, everywhere, all the time: insights into catchment processes from long-term and high-frequency hydrochemical data sets. *Bangor University,* January 2012.

111. Godsey, S. and **J.W. Kirchner**, Dynamic, discontinuous stream networks and their sensitivity to climate change. *Invited presentation, American Geophysical Union Fall Meeting,* San Francisco, December 2011.

110. **Kirchner, J.W.** and C. Neal, Everything, everywhere, all the time: insights into catchment processes from long-term and high-frequency hydrochemical data sets. *University of Strasbourg,* September 2011.

109. **Kirchner, J.W.**, Exploring landscapes and ecosystems by studying their streams. *Invited lecture, Gordon Research Seminar on Catchment Science,* July 2011.

108. **Kirchner, J.W.**, Exploring forest ecosystems by studying their streams. *Institute of Applied Ecology, Chinese Academy of Sciences, Shenyang, China,* May 2011.

107. **Kirchner, J.W.**, Environmental observatories and environmental gradients: challenges and opportunities for exploring the Earth's critical zone. *Invited presentation, European Geosciences Union General Assembly,* Vienna, April 2011.

106. **Kirchner, J.W.**, Hydrological processes revealed by high-frequency chemical dynamics spanning the periodic table. *University of Florida,* February 2011.

105. **Kirchner, J.W.**, Hydrological processes revealed by high-frequency chemical dynamics spanning the periodic table. *Bayreuth Center for Ecology and Environmental Research, University of Bayreuth,* January 2011.

104. **Kirchner, J.W.** and C. Neal, Groundwater-surface water interactions at Plynlimon, Wales, inferred from environmental tracers spanning the periodic table. *Invited presentation, American Geophysical Union Fall Meeting,* San Francisco, December 2010.

103. **Kirchner, J.W.** and C. Neal, Water quality trends spanning the periodic table, on timescales from hours to decades. *Invited presentation, American Geophysical Union Fall Meeting,* San Francisco, December 2010.

102. **Kirchner, J.W.**, Hydrological processes revealed by high-frequency chemical dynamics spanning the periodic table. *Berkeley Catchment Science Symposium,* December 2010.

101. **Kirchner, J.W.**, Exploring the geochemistry of landscape dynamics using cosmogenic nuclides. *Laboratory of Ion Beam Physics, ETH Zürich*, November 2010.

100. **Kirchner, J.W.**, High-frequency dynamics in stream chemistry, across the periodic table. *University of Utrecht,* October 2010.

99. **Kirchner, J.W.** and C. Neal, Hydrological processes revealed by high-frequency chemical dynamics spanning the periodic table. *Invited presentation, CUAHSI Biennial Symposium, Boulder, Colorado*, July 2010.

98. **Kirchner, J.W.** and C. Neal, Stochastic subsurface hydrological processes revealed by high-frequency chemical dynamics spanning the periodic table, Invited presentation. *Monte Verità conference on stochastic subsurface hydrology, Centro Stefano Franscini, Ascona, Switzerland,* June 2010.

97. **Kirchner, J.W.**, Catchments as simple dynamical systems: catchment characterization, rainfall-runoff modeling, and doing hydrology backwards. *Invited lecture, 2010 Freshwater Biology Summit, Freshwater Biological Association, Windermere, U.K.,* April 2010.

96. **Kirchner, J.W.**, Exploring environmental systems by studying their streams. *German Research Center for Geosciences (GFZ), Potsdam,* January 2010.

95. **Kirchner, J.W.**, Exploring environmental systems by studying their streams. *Swiss Federal Institute of Aquatic Science and Technology (EAWAG), Dübendorf, Switzerland,* October 2009.

94. **Kirchner, J.W.**, Exploring environmental systems by studying their streams. *Centre de Recherche Public - Gabriel Lippmann, Luxembourg,* October 2009.

93. **Kirchner, J.W.**, Effects of climate change on Earth's dynamic surface (and vice versa): Challenges and opportunities in studies of the Critical Zone. *Invited plenary lecture, European Geosciences Union General Assembly,* Vienna, April 2009).

92. **Kirchner, J.W.**, K. Liechti, M. Zappa, A. Teuling, and S. Seneviratne, Catchments as simple dynamical systems, at different scales and in different climatic regimes. *Invited presentation, European Geosciences Union General Assembly,* Vienna, April 2009.

91. **Kirchner, J.W.**, K.L. Ferrier, and C.S. Riebe, Exploring the geochemistry of landscape dynamics using cosmogenic radionuclides. *Invited presentation, European Geosciences Union General Assembly,* Vienna, April 2009.

90. **Kirchner, J.W.**, Simple models for complex hydrologic behavior: a challenge for basic research and engineering. *Invited plenary presentation, 6th Swiss Geoscience Meeting, Lugano,* November 2008.

89. **Kirchner, J.W.**, Exploring environmental systems by studying their streams. *Swiss Federal Institute of Technology (EPFL), Lausanne,* October 2008.

88. **Kirchner, J.W.**, The geochemistry of landscape dynamics. *Invited keynote presentation, 33rd International Geological Congress, Oslo*, August 2008.

87. Clow, D., S.E. Godsey, and **J.W. Kirchner**, Sensitivity of mineral weathering rates to annual variations in runoff. *Invited lecture, 18th international V.M. Goldschmidt Conference*, Vancouver, Canada, July 2008.

86. **Kirchner, J.W.**, Exploring environmental systems by studying their streams. *AGU Fellow Address, American Geophysical Union 2008 Joint Assembly, Fort Lauderdale, Florida,* May 2008.

85. **Kirchner, J.W.**, Are hydrologic systems complex, or just complicated, or maybe simpler than we thought? *Invited plenary lecture, European Geosciences Union General Assembly, Vienna,* April 2008.

84. **Kirchner, J.W.**, Simple models for complex hydrologic behavior: a challenge for basic research and engineering. *Invited keynote presentation, European Geosciences Union General Assembly, Vienna*, April 2008.

83. **Kirchner, J.W.**, Exploring catchments by studying their streams. *Swiss Federal Institute of Aquatic Science and Technology (EAWAG), Kastanienbaum, Switzerland*, April 2008.

82. **Kirchner, J.W.**, Exploring catchments by studying their streams. *University of California, Merced*, February 2008.

81. **Kirchner, J.W.**, Exploring catchments by studying their streams. *National Institute of Water and Atmospheric Research, Christchurch, New Zealand*, January 2008.

80. **Kirchner, J.W.**, Exploring environmental systems by studying their streams. *Institute of Environmental Engineering, Swiss Federal Institute of Technology (ETH), Zurich*, November 2007.

79. **Kirchner, J.W.**, Exploring watersheds by studying their streams. *Bren School of Environmental Science and Management, University of California, Santa Barbara*, November 2007.

78. **Kirchner, J.W.**, The chemistry of Earth's dynamic surface: linkages between physical erosion and chemical weathering in mountainous granitic landscapes. *Institute for Tibetan Plateau Research, Chinese Academy of Sciences, Beijing,* September, 2007.

77. **Kirchner, J.W.**, The chemistry of Earth's dynamic surface: linkages between physical erosion and chemical weathering in mountainous granitic landscapes. *University of Colorado, Boulder,* September, 2007.

76. **Kirchner, J.W.**, The chemistry of Earth's dynamic surface. *Invited plenary lecture, 17th international V.M. Goldschmidt Conference*, Cologne, Germany, August 2007.

75. **Kirchner, J.W.**, Developing a dynamical systems approach to hydrology, using intensively monitored research watersheds. *Invited lecture, Gordon Research Conference on Catchment Science*, July 2007.

74. **Kirchner, J.W.**, Doing hydrology backwards: inferring catchment-scale governing equations, rainfall rates, and evapotranspiration patterns from streamflow time series. *University of California, Los Angeles,* May 2007.

73. **Kirchner, J.W.**, Exploring forest ecosystems by studying their streams. *Swiss Federal Institute for Forest, Snow, and Landscape Research, Zurich,* and *Swiss Federal Institute for Snow and Avalanche Research, Davos,* March 2007.

72. **Kirchner, J.W.**, Exploring forest ecosystems by studying their streams. *Stanford University*, February 2007.

71. **Kirchner, J.W.**, Doing hydrology backwards: Inferring landscape-scale precipitation and evapotranspiration from streamflow time series. *Invited presentation, American Geophysical Union Fall Meeting,* San Francisco, December 2006.

70. **Kirchner, J.W.**, Reflections of preferential flow at the hillslope and catchment scale. *Invited presentation, Monte Verita International Workshop on Preferential Flow and Transport Processes in Soil, Ascona, Switzerland,* November 2006.

69. **Kirchner, J.W.**, Environmental physics of hillslopes and catchments. *Swiss Federal Institute of Technology (ETH), Zurich,* November 2006.

68. **Kirchner, J.W.**, Doing hydrology backwards: inferring catchment-scale governing equations, rainfall rates, and evapotranspiration patterns from streamflow time series. *Invited lecture Workshop on Prediction in Ungauged Basins, Corvallis, OR,* October 2006.

67. **Kirchner, J.W.**, S.E. Godsey, X. Feng, and C. Neal, Quantifying timescales of catchment response using hydrological and hydrochemical time series data. *Invited presentation, Biogeomon International Symposium on Ecosystem Behavior,* Santa Cruz, CA, June 2006.

66. **Kirchner, J.W.**, Disturbed landscapes as natural laboratories for testing hydrological and biogeochemical models. *Invited presentation, American Geophysical Union Fall Meeting,* San Francisco, December 2005.

65. **Kirchner, J.W.**, Watershed characterization by spectral analysis of hydrological and hydrochemical time series. *Invited presentation, American Geophysical Union Fall Meeting,* San Francisco, December 2005.

64. **Kirchner, J.W.**, Understanding forest ecosystems by studying their streams. *USFS Forest Sustainability Conference, Nevada City, CA,* October 2005.

63. **Kirchner, J.W.**, A spectral view of catchment hydrology and geochemistry. *Duke University,* October 2005.

62. **Kirchner, J.W.**, C.S. Riebe, K.L. Ferrier, and R.C. Finkel, Cosmogenic nuclide methods for measuring long-term rates of physical erosion and chemical weathering. *Invited keynote presentation, Seventh International Symposium on Geochemistry of the Earth's Surface*, Aix-en-Provence, France, August 2005.

61. **Kirchner, J.W.**, Sediment yields on timescales from minutes to millions of years. *Keynote address, California Conference on Water Quality, Redding, CA,* April 2005.

60. Troch, P., P. Bogaart, R. Uijlenhoet, A. Berne, J. Boll, J. McDonnell, and **J. Kirchner**, Catchment water residence time: Understanding the relation between landscape organization and flow pathways. *VIIth IAHS Scientific Assembly, Foz do Iguaçu, Brazil,* April 2005.

59. **Kirchner, J.W.**, A spectral view of catchment hydrology and geochemistry. *Invited lecture, International Conference on Integrated Assessment of Water Resources and Global Change, Bonn, Germany,* February 2005.

58. **Kirchner, J.W.**, Biodiversity dynamics inferred from the fossil record. *University of California Museum of Paleontology, Berkeley,* October 2005.

57. **Kirchner, J.W.**, A spectral view of catchment hydrology and geochemistry. *Stanford University,* December 2004.

56. **Kirchner, J.W.**, A spectral view of catchment hydrology and geochemistry. *Invited lecture, Gilbert Club Annual Meeting, Berkeley,* December 2004.

55. **Kirchner, J.W.**, Biodiversity dynamics in the fossil record. *Homecoming Faculty Lecture, University of California, Berkeley,* October 2004.

54. **Kirchner, J.W.**, Chemical weathering, physical erosion, and climate: a cosmogenic perspective. *W.T. Smith Lecture, University of Michigan*, October 2004.

53. **Kirchner, J.W.**, A spectral view of catchment processes. *Invited lecture, NSF/CUAHSI Workshop on Catchment Hydrology, Corvallis, OR,* June 2004.

52. **Kirchner, J.W.**, A cosmogenic view of physical erosion and chemical weathering in mountainous granitic landscapes. *Czech Geological Survey, Prague,* March 2004.

51. **Kirchner, J.W.**, A spectral view of catchment hydrology and geochemistry. *Invited lecture, Australia-Japan Workshop on Prediction in Ungauged Basins, Perth, Australia,* February 2004.

50. **Kirchner, J.W.**, A cosmogenic view of physical erosion and chemical weathering in mountainous granitic landscapes. *Invited presentation, NSF Weathering System Science Consortium Workshop, Baltimore, MD,* October 2003.

49. **Kirchner, J.W.**, A spectral view of catchment hydrology and geochemistry. *University of California, Berkeley (Dept. of Geography),* September 2003.

48. **Kirchner, J.W.**, X. Feng and C. Neal, Power-law filters of catchment response: physical interpretations and geochemical implications. *Invited lecture, Gordon Conference on Catchment Science,* July 2003.

47. **Kirchner, J.W.**, A spectral view of catchment hydrology and geochemistry. *Cornell University,* May 2003.

46. **Kirchner, J.W.**, Biodiversity dynamics revealed through spectral analysis of the fossil record. *Miller Institute for Basic Research, University of California, Berkeley,* April 2003.

46. **Kirchner, J.W.**, Dynamics of evolution and extinction revealed through spectral analysis of the fossil record. *Neyman Lecture, Dept. of Statistics, University of California, Berkeley,* January 2003.

45. **Kirchner, J.W.**, Dynamics of evolution and extinction revealed through spectral analysis of the fossil record. *University of California, Berkeley, Faculty Forum,* November 2002.

44. **Kirchner, J.W.**, A spectral view of catchment hydrology and geochemistry. *Oregon State University,* May 2002.

43. **Kirchner, J.W.**, A spectral view of catchment hydrology and geochemistry. *Dartmouth College,* February 2002.

42. **Kirchner, J.W.**, Mountain erosion over 10-year, 10,000-year, and 10,000,000-year timescales. *University of California, Davis,* February 2002.

41. **Kirchner, J.W.**, A spectral view of catchment hydrology and geochemistry. *University of Arizona,* November 2001.

40. **Kirchner, J.W.**, A spectral view of catchment hydrology and geochemistry. *U.C. Berkeley, Dept. of Civil and Environmental Engineering,* November 2001.

39. **Kirchner, J.W.**, A spectral view of catchment hydrology and geochemistry. *Invited lecture, American Geophysical Union Chapman Conference on State-of-the-Art Hillslope Hydrology, Sunriver, OR,* October 2001.

38. **Kirchner, J.W.**, Mountain erosion over 10-year, 10,000-year, and 10,000,000-year timescales. *Idaho Fire and Erosion Workshop, Boise, ID*, July 2001.

37. **Kirchner, J.W.**, Mountain erosion over 10-year, 10,000-year, and 10,000,000-year timescales. *Johns Hopkins University,* April 2001.

36. **Kirchner, J.W.**, Mountain erosion over 10-year, 10,000-year, and 10,000,000-year timescales. *University of California, Berkeley,* December 2000.

35. **Kirchner, J.W.**, Mountain erosion over 10-year, 10,000-year, and 10,000,000-year timescales. *University of California, Santa Cruz,* October 2000.

34. **Kirchner, J.W.**, Simplicity and complexity, in model watersheds and real ones. *Invited lecture, Gordon Conference on Hydrological, Biological, and Geochemical Processes in Forested Catchments,* July 1999.

33. **Kirchner, J.W.**, A systems approach to forest ecosystem research. *Swiss Federal Institute of Technology (ETH), Zurich,* May 1998.

32. **Kirchner, J.W.**, Cosmogenic isotope methods for measuring long-term rates of erosion and weathering. *University of Oregon,* May 1998.

31. **Kirchner, J.W.**, Cosmogenic isotope methods for measuring long-term rates of erosion and weathering. *Swiss Federal Institute of Technology (ETH), Zurich,* May 1998.

30. **Kirchner, J.W.**, Why the acid rain problem hasn't gone away: long-term effects of acid deposition on the geochemistry of lakes and streams. *Göttingen University*, November 1997.

29. **Kirchner, J.W.**, Cosmogenic isotope methods for measuring long-term rates of erosion and weathering. *University of Reading (UK),* November, 1997.

28. **Kirchner, J.W.**, D.E. Granger and C.S. Riebe, Cosmogenic isotope methods for measuring catchment erosion and weathering rates. *Invited presentation, BIOGEOMON 3rd Int'l Symposium on Ecosystem Behavior,* Villanova University, June 1997.

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Honors citations

The 2013 Ralph Alger Bagnold Medal is awarded to James W. Kirchner for his outstanding contributions to our understanding of geomorphological processes using innovation and rigor in data analysis and slicing through the complexity of Earth's surface systems to uncover the underlying physics.