

Erin C. Seybold
Assistant Scientist
Kansas Geological Survey
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Education

Ph.D.	Duke University	Ecology	2017
B.A.	St. Olaf College	Biology and Environmental Science	2011

Professional Appointments

Assistant Scientist 2019
Kansas Geological Survey, University of Kansas

Postdoctoral Associate 2017 – 2019
Vermont EPSCoR, University of Vermont

Research Interests

Aquatic biogeochemistry, watershed hydrology, groundwater-surface water interactions, effects of anthropogenic change on water quality

Awards, Fellowships, and Certificates

Duke University Certificate in College Teaching	2017
NSF-USGS Graduate Research Internship Program Fellow	2016
NSF Graduate Research Fellow	2013 – 2017
Fulbright Scholar	2011
Phi Beta Kappa Member	2011
Goldwater Scholar	2010

Funded Research Support

NSF EPSCoR: *Emerging STEM Scholar: Building STEM workforce capacity in undergraduates and mentors*. Co-PI with Blair Schneider (KGS). Total award amount \$999,835. Funded in 2022; 5 year project.

USDA NIFA: *Irrigation at the new 100th Meridian: Adaptation to manage climate risks and preserve water resources in the Eastern Kansas River Basin*. Co-PI with Sam Zipper (KGS). Total award amount \$750,000. Funded in 2021; 4-year project.

Kansas Water Office: *Groundwater Nitrate Dynamics at the Flickner Innovation Farm*. PI. Total award amount \$15,000. Funded in 2021; 1.5-year project.

NSF EPSCoR: *Aquatic Intermittency effects on Microbiomes in Streams (AIMS)*. Co-PI. Total award amount \$6M to KU. Funded in 2020; 4-year project.

NSF Critical Zone Observatories Program: *Collaborative Research - Using Big Data approaches to assess ecohydrological resilience across scales*. PI. KGS Award \$94,675; part of larger \$5M network grant. Funded in 2020; 5-year project.

DOE Environmental System Science Program: *Linking nutrient reactivity and transport in subsurface flowpaths along a terrestrial-estuarine continuum*. Co-PI. \$34,946 to KGS, subaward of larger \$600k grant. Funded in 2020; 3-year project.

Kansas Water Resources Institute: *Spatial variability and subsurface controls of groundwater recharge and nutrient mobilization in dry streams*. PI. Co-PIs Sam Zipper (KGS) and Chi Zhang (KU). Total amount \$40,000. Funded in 2020; 2-year project.

Kansas Water Resource Institute: *Simulating the effects of reservoir management strategies on in-stream sediment load, streambank stability, and water quality*. Co-PI. Total amount \$30,000. Funded in 2020; 2-year project.

Kansas Water Office: *Assessment of Groundwater Mineralization in the Upper Arkansas River Corridor*. Co-PI. Total amount \$77,000. Funded in 2019; 2-year project currently in no-cost extension until 2022.

California Sea Grant, Marine Pollution Program: *Linking terrestrial pollution to estuarine water quality: Quantification of the role of groundwater in the transport, transformation and removal of agricultural pollutants in Elkhorn Slough, CA*. Co-PI. Total amount \$243,000. Funded in 2019; 3-year project.

NSF Graduate Research Internship Program Fellowship: *Assessing the influence of redox microzones on whole-stream denitrification rates*. U.S. Geological Survey Office of Groundwater Geophysics Branch. Total amount \$5,000. Funded in 2016 - completed in 2017.

NSF Graduate Research Fellowship: *Ecohydrologic controls on carbon cycling: coupling carbon & water at the watershed scale*. Total amount \$178,000. Funded in 2013 - completed in 2017.

Grant proposals pending or not funded

NSF DEB Ecosystem Sciences Cluster: *Persistence, patterns, and biogeochemical impacts of agricultural legacies in urban waters*. PI. Requested amount: \$512,500. Submitted in 2020/rejected in 2021.

NSF Human-Environment and Geographical Sciences Program: *Unpacking polycentric climate adaptation for a shared hydrologic resource: the impacts of multiscale and multisector coordination*. Co-PI. Requested amount: \$398,272. Submitted/rejected in 2021.

DOE Subsurface Biogeochemical Research Program: *Linking hydrologic and ecological impacts of tidal variability on subsurface biogeochemical processes at coastal terrestrial-aquatic interfaces*. Co-PI. Requested amount: \$999,300 (\$208,758 to KGS). Submitted/rejected in 2021.

NASA NSPIRES Program: *Bridging catchment hydrology and global remote sensing: Role of rain-on-snow events in hydrologic regimes*. Co-I. Requested amount: \$615,681 (\$31,681 to KGS). Submitted/rejected in 2021.

Publications (*denotes student author)

Seybold EC, Dwivedi R, Musselman K, Kincaid DW, Schroth AW, Adair CA, Claussen A, Perdrial JN. 2022. Winter runoff events pose an unquantified continental-scale risk of high wintertime nutrient export. *Environmental Research Letters*. <https://doi.org/10.1088/1748-9326/ac8be5>

Perdrial JN, Kincaid DW, Wheaton D, **Seybold EC**, Stewart* B, Walls L, Blouin M, Toolin R, Chorover J (In review) Equity, Diversity, and Community as the Basis for Critical Zone Science and Education. In review at *Earth's Futures*.

Zipper SC, Popescu* I, Compare* K, Zhang C, **Seybold EC**. 2022. Alternative states and hydrological regime shifts in a large intermittent river. *Environmental Research Letters*. <https://doi.org/10.1088/1748-9326/ac7539>

Grande* E, Arora B, Visser A, Montalvo* M, Braswell AE, **Seybold EC**, Tatariw C, Beheshti K, Zimmer MA. 2022. Tidal frequencies and quasiperiodic subsurface water level variations dominate redox dynamics in a salt marsh system. *Hydrological Processes*. <https://doi.org/10.1002/hyp.14587>

Seybold EC, Fork ML, Braswell AE, Blaszczyk J, Fuller MR, Kaiser KE, Mallard JM, Zimmer MA. (2021) A Classification Framework for Assessing Ecological, Biogeochemical, and Hydrological Synchrony and Asynchrony. *Ecosystems*. <https://doi.org/10.1007/s10021-021-00700-1>

Siegert CM, Suriano ZJ, Leathers DJ, Gold AJ, Addy K, Schroth AW, **Seybold EC**, Inamdar S, Levia DF. (202) Effects of Atmospheric Circulation on Stream Chemistry in Forested Watersheds across the Northeastern United States: Part 1. Synoptic-scale Forcing. Accepted at *JGR-Atmospheres*. <https://doi.org/10.1029/2020JD033413>

Suriano ZJ, Siegert CM, Leathers DJ, Gold AJ, Addy K, Schroth AW, **Seybold EC**, Inamdar S, Levia DF. (2021) Effects of Atmospheric Circulation on Stream Chemistry in Forested Watersheds across the Northeastern United States: Part 2. Interannual Weather Type Variability. *JGR-Atmospheres*. <https://doi.org/10.1029/2021JD034546>

Kincaid DW, **Seybold EC**, Adair EC, Bowden WB, Perdrial JN, Vaughan MCH, Schroth AW. (2020) Land use and season influence event-scale riverine export dynamics of nitrate and soluble reactive phosphorus from headwater catchments. *Water Resources Research*. <https://doi.org/10.1029/2020WR027361> *Awarded WRR Editor's Choice Award*

Landsman-Gerjoi* M, Perdrial JN, Lancellotti* B, **Seybold EC**, Schroth AW, Adair CA, Wymore A. (2020) Measuring the influence of environmental conditions on dissolved organic matter biodegradability and optical properties: a combined field and laboratory study. *Biogeochemistry*. <https://doi.org/10.1007/s10533-020-00664-9>

Seybold EC, Gold A, Inamdar S, Bowden WB, Vaughan M, Pradhanang S, Addy K, Shanley J, Vermilyea A, Levia D, Adair C, Wemple B, Schroth A. (2019) Influence of land use and hydrologic variability on seasonal dissolved organic carbon and nitrate export: insights from a multi-year regional analysis for the northeastern USA. *Biogeochemistry*. <https://doi.org/10.1007/s10533-019-00609-x>

Seybold EC, McGlynn BL. (2018) Hydrologic and biogeochemical drivers of dissolved organic carbon and nitrate uptake in headwater stream networks. *Biogeochemistry*. <https://doi.org/10.1007/s10533-018-0426-1>

Bernhardt ES, Blaszczyk J, Ficken C, Fork M, Kaiser K, **Seybold EC**. (2017) Control Points in Ecosystems: Moving beyond the hot spot hot moment concept. *Ecosystems*.
<https://doi.org/10.1007/s10021-016-0103-y>

Schade JD, **Seybold EC**, Drake T, Spawn S, Sobczak W, Frey KE, Holmes RM, Zimov N. (2016) Variation in summer nitrogen and phosphorous uptake among Siberian headwater streams. *Polar Research* 35. <https://doi.org/10.3402/polar.v35.24571>

Book Chapters and Open File Reports (*denotes student author)

Popescu* I, Zipper SC, **Seybold EC**. (2022) Identifying Regime Shifts in the Arkansas River near Larned, KS. Kansas Geological Survey Open-File Report 2022-4.

Compare* K, Zipper SC, Zhang C, **Seybold EC**. (2021) Characterizing streamflow intermittency and subsurface heterogeneity in the middle Arkansas river basin. Kansas Geological Survey Open-File Report 202. <https://www.kgs.ku.edu/Publications/OFR/2021/OFR2021-1.pdf>

Seybold EC, McGlynn BL, Yashan D (2021) Middle Rockies: Tenderfoot Creek Experimental Forest, Montana. In: Biological Responses to Stream Nutrients: A Synthesis of Science from Experimental Forests and Ranges. *General Technical Report 981*. U.S. Department of Agriculture, Forest Service, Pacific Northwest Research Station. https://www.fs.fed.us/pnw/pubs/pnw_gtr981.pdf

Invited seminars

Seybold EC. April 2022. (invited seminar) How low can you go? Understanding the hydrologic and ecological function of non-perennial stream ecosystems. Department of Geology Colloquium, University of Vermont, *Burlington, VT*.

Seybold EC. September 2020. (invited seminar) Exploring the effects of environmental change on the hydrogeochemistry of groundwater and surface water using high frequency sensor networks. Department of Geology Seminar Series, Wichita State University, *Wichita, KS*.

Seybold EC. March 2020. (invited seminar) Biogeochemical effects of changing winter climate on aquatic nutrient dynamics from watershed to continental scales. Division of Biology Seminar Series, Kansas State University, *Manhattan, KS*.

Seybold EC. February 2020. (invited seminar) Effects of rain on snow events and changing winter climate on aquatic nutrient dynamics. Department of Geology Seminar Series, University of Kansas, *Lawrence, KS*.

Seybold EC. November 2019. (invited seminar) Taking the pulse of water quality: Understanding the effects of environmental change on the hydrogeochemistry of groundwater and surface water. Kansas Biological Survey Seminar Series, University of Kansas, *Lawrence, KS*.

Select conference presentations/published abstracts (in last 5 years; *denotes student first author)

Seybold EC et al. 2022. (poster presentation) Linking oxygen regimes to flow regimes in non-perennial streams. *AGU Fall Meeting*, Chicago, IL.

Zeglin L, Kerner T, Aho K, Brisendine J, Bond C, Burgin AJ, Hansen P, Jackson C, Kuehn K, Lee S, Nave B, Ramos R, Semenova T, **Seybold EC**, Sikes BA, Swenson L, Tchamba ALK, Thomas SG, Wheeler C, Wohler A, You Y, Zipper SC. 2022. (poster presentation) Assessing terrestrial-aquatic microbiome connectivity in non-perennial streams. *AGU Fall Meeting*, Chicago, IL.

Burgin AJ, Allen DC, Brown C, Cook SC, Flynn S, Nave B, **Seybold EC**, Swenson L, Wheeler C, Wilhelm J, Zeglin L, Zarek K, Zipper SC. 2022. (poster presentation) Building the Aquatic Intermittency effects on Microbiomes in Streams (AIMS) network to enable understanding of how intermittent flow impacts water quality and stream microbiomes. *AGU Fall Meeting*, Chicago, IL.

Kincaid DW, Underwood K, Hamshaw S, Ul Haq I, Li L, Rizzo D, **Seybold EC**, Stewart B, Perdrial JN. 2022. (invited poster presentation) Leveraging Catchment Attributes to Explain Patterns of Concentration-Discharge Relationships Across the Contiguous United States. *AGU Fall Meeting*, Chicago, IL.

Perdrial J, Ruckhaus M, **Seybold EC**, Underwood K, Kincaid DW, Shanley J, *Stewart B, Li Li. 2022. (poster presentation) Drivers and pathways of carbon and nitrogen in soil and streams: insights from the Sleepers River Research Watershed in Vermont. *AGU Fall Meeting*, Chicago, IL.

Stewart B*, Shanley J, Matt S, Perdrial JN, Ruckhaus M, **Seybold EC**, Kincaid DW, Li Li. 2022. (oral presentation) Stream DOC and DIC Response to Climate and Acidification Disturbances at Sleepers River. *AGU Fall Meeting*, Chicago, IL.

*Grande E, **Seybold EC**, et al. 2022. (oral presentation) Seasonal and tidal forcing control salt marsh porewater nitrate dynamics in a Mediterranean system. *AGU Fall Meeting*, Chicago, IL.

*Grande E, Visser, A, Oerter E, Arora B, **Seybold EC**, Tatariw C, Braswell A, Zimmer M. 2022 (oral presentation) Flow directions and velocities of subsurface water in a Mediterranean salt marsh system constrained by isotope tracing. *AGU Fall Meeting*, Chicago, IL.

Zimmer MA, Grande E, Montalvo M, **Seybold EC**, Tatariw C, Visser A, Braswell A, Arora B, Hynes A, Romero J, Birgand F, Haskins J. Identification of Hot Moments of Nutrient Processing in Coastal Systems Using High Frequency Sensors. 2022. (oral presentation) *AGU Fall Meeting*, Chicago, IL.

Romero J*, Tatariw C, Haynes A, Grande E, Montalvo M, Wilshire M, Carlson HK, Braswell A, **Seybold EC**, Visser A, Arora B, Dwivedi D, Zimmer MA. 2022. (poster presentation) Investigating Hydrobiogeochemical Drivers of Salt Marsh Nitrogen Cycling. *AGU Fall Meeting*, Chicago, IL.

Montalvo M*, Grande E, Braswell AE, Haskins J, Endris C, Gerbl F, Huang MH, Visser A, Arora B, **Seybold EC**, Tatariw C, Grunewald ED, Zimmer MA. 2022. (oral presentation) Seasonal Terrestrial Freshwater Inputs Impact Salt Marsh Hydrology. *AGU Fall Meeting*, Chicago, IL.

Seybold EC et al. 2022. (oral presentation) Changes in groundwater contributions influence streamwater chemistry during dry-down of a prairie stream. *Joint Aquatic Science Meeting*, Grand Rapids, MI.

Brown CL*, Wheeler C, Speir SL, Allen DC, Benstead JP, Burgin AJ, Hale RL, **Seybold EC**. 2022. (poster presentation) Duration of drying controls the magnitude and recovery of metabolism in U.S. intermittent streams. *Joint Aquatic Science Meeting*, Grand Rapids, MI.

Seybold EC et al. 2021. (invited oral presentation) The effects of flow intermittency and groundwater-surface water exchange on stream biogeochemistry in a non-perennial prairie stream. *AGU Fall Meeting*, New Orleans, LA.

Zipper SC, Compare K, Popescu I, **Seybold EC**, Zhang C. 2021. (poster presentation) Flow regimes and alternate stable states in a non-perennial river. *AGU Fall Meeting*, New Orleans, LA.

*Ruckhaus M, **Seybold EC**, Petrino M, Shanley J, Stewart B, Li L, Underwood K, Lini A, Perdrial JN. 2021. (poster presentation) Carbon and Nitrogen Dynamics in Sleepers River Research Watershed: A Combined Lab and Field Study. *AGU Fall Meeting*, New Orleans, LA.

Perdrial JN, Kincaid DW, Wheaton D, Walls L, Ul Haq I, Rizzo D, Hamshaw SD, Lee BS, **Seybold EC**, Lewis G, Toolin RE, Chorover J. 2021. (oral presentation) Why Critical Zone (CZ) science needs team science: insights from the big data CZ network cluster. *AGU Fall Meeting*, New Orleans, LA.

*Montalvo M, Grande E, Zimmer MA, Braswell AE, Haskins JC, Endris C, Gerbl F, Tatariw C, Arora B, Visser A, **Seybold EC**, Caldwell W, Grunewald ED. 2021 (poster presentation) Seasonal Changes in Subsurface Hydrology Influence Nutrient Cycling in a Salt Marsh. *AGU Fall Meeting*, New Orleans, LA.

Tatariw C, **Seybold EC**, Montalvo M, Zimmer MA, Kleinhuizen A, Visser A, Braswell AE, Grande E, Arora B. 2021. (poster presentation) Seasonal Precipitation is a Hydrologic Driver of Salt Marsh Nitrogen Removal. *AGU Fall Meeting*, New Orleans, LA.

*Grande E, Arora B, Visser A, Montalvo M, Braswell AE, **Seybold EC**, Tatariw C, Beheshti K, Zimmer MA. 2021. (oral presentation) Tidal frequencies and quasiperiodic subsurface water level variations dominate redox dynamics in a salt marsh system. *AGU Fall Meeting*, New Orleans, LA.

Seybold EC et al. 2021. (oral presentation) Effects of rain on snow events on runoff generation and nutrient export from forested and agricultural catchments in northern Vermont. *Society of Freshwater Sciences Annual Meeting*, virtual conference.

Kincaid D, Hamshaw S, Underwood K, **Seybold EC**, Adair C, Perdrial J, Rizzo D, Wemple B, Schroth A. 2021. (oral presentation) Self-organizing maps reveal the influence of event regimes on dissolved N and P export dynamics from an agricultural and forested watershed. *Society of Freshwater Sciences Annual Meeting*, virtual conference.

*Grande E, Zimmer MA, **Seybold EC**, Braswell AE, Tatariw C, Greene A, Montalvo M, Birgand F, Visser A. 2020. (poster presentation) Using high spatiotemporal nitrate measurements to assess nutrient transport and transformations at the terrestrial-marine interface of a tidal watershed. *AGU Fall Meeting*, virtual location.

Seybold EC et al. 2019. (poster presentation) Using high-frequency sensor networks to quantify terrestrial nitrogen sources to a coastal estuary. *Coastal and Estuarine Research Federation Biannual Meeting*, Mobile, AL.

Seybold EC and BL McGlynn. 2019. (oral presentation) Influence of catchment morphology on biophysical drivers of carbon fluxes in headwater streams. *Society of Freshwater Science Annual Meeting*, Salt Lake City, UT.

Seybold EC et al. 2018. (oral presentation) Effects of changing winter snowmelt on watershed nutrient export from forested and agricultural catchments in northern Vermont. *AGU Fall Meeting*, Washington, D.C.

Seybold EC et al. 2018. (oral presentation) Effects of land use on the timing and magnitude of carbon and nitrogen fluxes: an analysis of high-frequency sensor measurements from forested, agricultural, and urban watersheds in the Lake Champlain Basin. *Lake Champlain Basin Conf.*, Burlington, VT.

Seybold EC et al. 2017. (poster) Effects of land use on the timing and magnitude of dissolved organic carbon and nitrate fluxes: a regional analysis of high-frequency sensor measurements from forested, agricultural, and urban watersheds. *AGU Fall Meeting*, New Orleans, LA.

Seybold EC and BL McGlynn. 2017. (oral presentation) Physical and biological influences on coupled C and N cycling in headwater streams. *AGU Fall Meeting*, New Orleans, LA.

Seybold EC and BL McGlynn. 2016. (oral presentation) Exploring the relative influence of hydrologic and biogeochemical drivers on carbon and nitrogen uptake across two contrasting headwater streams. *AGU Fall Meeting*, San Francisco, CA.

Mentoring Experience

Current:

Connor Brown (Ph.D. student, University of Kansas; primary adviser)

Shreya Chatterjee (Ph.D. student, University of Kansas; primary adviser)

Camden Hatley (Ph.D. student, University of Kansas; primary adviser)

Jessica Wilhelm (Ph.D. student, University of Kansas; committee member)

Sarah Flynn (Ph.D. student, University of Kansas; committee member)

Kari Snelling (M.S. student, University of Kansas; committee member)

Bryan Rodriguez-Colon (Ph.D. student, University of Kansas; committee member)

Shaurya Swami (Ph.D. student, University of Vermont; committee member and co-adviser)

Graduated:

Andria Greene (M.S. student, University of California Santa Cruz; committee member); Manya

Ruckhaus (M.S. student, University of Vermont; committee member)

Previous undergraduate or summer research students:

Thomas Adler (B.S., University of Vermont); Patrick Clay (B.S., University of North Carolina –

Chapel Hill); Kelsey Coates (B.S., Duquesne University); Mariah Cronin (B.S., University of

Vermont); Ricardo Feliciano-Rivera (B.S., University of Puerto Rico – Mayagüez); Amanda Jackson-

Mojica (B.S., University of Puerto Rico – Mayagüez); Kunal Palawat (B.S., University of Vermont);

Emily Persiak (B.S., University of Vermont); Julia Petty (B.S., University of Vermont); Ellie Sovcik

(B.S., University of Vermont; Honors thesis advisee); Michelle Wolford (B.S., Colorado College);

Valerie Xayaphat (B.S. student, University of Kansas; Emerging Scholars program); Colleen Yancy

(B.S., University of Vermont)

Teaching Experience

Teaching Assistant, Dynamic Earth (Introductory Earth Science) – Duke University	2016
Teaching Assistant, Earth Surface Processes – Duke University	2015
Teaching Assistant, Landscape Hydrology – Duke University	2013
Teaching Assistant, Water Resources Management – Duke University	2012

Leadership, outreach, and service to scientific community and society (last 5 years)

Member of AGU Water Quality Technical Committee
Co-director of KGS Applied Geohydrology Internship Program
Member of CZO Big Data Cluster Education and Outreach Team
Topic Editor, Women in Science special issue for Frontiers in Water
Reviewer for 10+ peer-reviewed journals (7 reviews in 2021)
Ad-hoc Reviewer for NSF proposals (DEB Ecosystem Sciences Cluster, GLD)
Panelist for NSF DEB Ecosystem Sciences Cluster and NSF Hydrologic Sciences
AGU Fall Meeting session convener (2021 and 2022 Frontiers in Water Quality sessions)