Sarah Michelle Collins

CONTACT INFORMATION

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ACADEMIC APPOINTMENTS

Assistant Professor

University of Wyoming, Department of Zoology and Physiology — August 2018-

Postdoctoral Research Fellow

University of Wisconsin Madison, Center for Limnology — 2016-2018

Michigan State University, Department of Fisheries and Wildlife — 2014-2016

EDUCATION

Cornell University, Ithaca, NY

Ph.D., Ecology and Evolutionary Biology — January 2015

Lewis & Clark College, Portland, OR

B.A., *Cum Laude*, Biochemistry and Molecular Biology — May 2007

PUBLICATIONS (PUBLISHED OR IN PRESS)

Lapierre, J.F.*, **S.M. Collins***, S.K. Oliver, E.H. Stanley, T. Wagner. *In Press*. Inconsistent browning of Northeastern U.S. lakes despite increased precipitation and recovery from acidification. *Ecosphere* DOI: 10.1002/ecs2.3415
*First two authors contributed equally

Schliep, E.M., **S.M. Collins**, S.R. Salazar, N.R. Lottig and E.H. Stanley. 2020. Data fusion model to identify environmental drivers and improve estimation of total nitrogen in lakes. *Annals of Applied Statistics* 14: 1651-1675 DOI: 10.1214/20-AOAS137.

Lopez-Sepulcre, A, M. Bruneaux, **S.M. Collins**, R. El-Sabaawi, A.S. Flecker and S.A. Thomas. 2020. A new method to reconstruct quantitative food webs and nutrient flows from isotope tracer addition experiments. *The American Naturalist* 195: 964-985. DOI: 10.1086/708546

Collins, S.M., S. Yuan, P.N. Tan, S.K. Oliver, J.F. Lapierre, K.S. Cheruvelil, C.E. Fergus, N.K. Skaff, J. Stachelek, T. Wagner, and P.A. Soranno. 2019. Winter precipitation and summer temperature predict lake ecosystem properties at macroscales. *Water Resources Research* 55: 2708-2721. DOI: 10.1029/2018WR023088

McCullough, I.M., K.S. Cheruvelil, **S.M. Collins**, and P.A. Soranno. 2019. Geographic patterns of the climate sensitivity of lakes. *Ecological Applications* 29: e01836. DOI: 10.1002/eap.1836

Soranno, P.A., T. Wagner, **S.M. Collins**, J.F. Lapierre, N.R. Lottig, and S.K. Oliver. 2019. Spatial and temporal variation of ecosystem properties at macroscales. *Ecology Letters* 22: 1587-1598. DOI: 10.1111/ele.13346

Stanley, E.H., **S.M. Collins**, N.R. Lottig, S.K. Oliver, K. Webster, K.S. Cheruvelil, and P.A. Soranno. 2019. Biases in lake water quality sampling and implications for macroscale research. *Limnology and Oceanography* 64: 1572-1585. DOI: 10.1002/lno.11136

Stanley, E.H., S. Salzaar, N.R. Lottig, E.M. Schliep, C.T. Filstrup and **S.M. Collins**. 2019. Comparison of total nitrogen data from direct and Kjeldahl-based approaches in integrated datasets. *Limnology and Oceanography Methods* 17: 639-649. DOI: 10.1002/lom3.10338

Lapierre, J.F., **S.M. Collins**, D. Seekell, K.S. Cheruvelil, P.N. Tan, N.K. Skaff, Z. Taranu, C.E. Fergus and P.A. Soranno. 2018. The role of spatial structure in understanding the relationships between ecosystem properties at macroscales. *Global Ecology and Biogeography* 27: 1251-1263. DOI: 10.1111/geb.12781

Tank, J.L, E. Marti, T. Riis, D. von Schiller, A.J. Reisinger, W.K. Dodds, M.R. Whiles, L.R. Ashkenas, W.B. Bowden, **S.M. Collins**, C.L. Crenshaw, T.A. Crowl, N.A. Griffiths, N.B. Grimm, S.K. Hamilton, S.L. Johnson, W.H. McDowell, B.M. Norman, E.J. Rosi, K.S. Simon, S.A. Thomas and J.R. Webster. 2018. Partitioning assimilatory nitrogen uptake in streams: an analysis of stable isotope tracer additions across continents. *Ecological Monographs* 88: 120-138. DOI: 10.1002/ecm.1280

Cheruvelil K.S., S. Yuan, K.E. Webster, P.N. Tan, J.F. Lapierre, **S.M. Collins**, C.E. Fergus, C.E. Scott, E.N. Henry, P.A. Soranno, C.T. Filstrup, and T. Wagner. 2017. Creating multi-themed ecological regions for macroscale ecology: Testing a flexible, repeatable, and accessible clustering method. *Ecology and Evolution* 7: 3046-3058. DOI: 10.1002/ece3.2884

Collins, S.M., S.K. Oliver, J.F. Lapierre, E.H. Stanley, J.R. Jones, T. Wagner, and P.A. Soranno. 2017. Lake nutrient stoichiometry is less predictable than nutrient concentrations at regional and sub-continental scales. *Ecological Applications* 27: 1529-1540. DOI: 10.1002/eap.1545

Lapierre, J.F., D. Seekell, C.T. Filstrup, **S.M. Collins**, C.E. Fergus, P.A. Soranno, and K.S. Cheruvelil. 2017. Continental-scale variation in controls of summer CO_2 in United States lakes. *Journal of Geophysical Research - Biogeosciences* 122: 875-885. DOI: 10.1002/2016JG003525

Norman, B.C., M.R. Whiles, **S.M. Collins**, A.S. Flecker, S.K. Hamilton, S.L. Johnson, E.J. Rosi-Marshall, L.R. Ashkenas, W.B. Bowden, C.L. Crenshaw, T.A. Crowl, W.K. Dodds, R.O. Hall, R. El-Sabaawi, N.A. Griffiths, E. Marti, W.H. McDowell, S.D. Peterson, H.M. Rantala, T. Riis, K.S. Simon, J.L. Tank, S.A. Thomas, D. von Schiller and J.R. Webster. 2017. Drivers of nitrogen transfer efficiencies in stream food webs across continents. *Ecology* 98: 3044-3055. DOI:10.1002/ecy.2009

Oliver, S.K., **S.M. Collins**, P.A. Soranno, T. Wagner, E.H. Stanley, J.R. Jones, C.A. Stow, N.R. Lottig. 2017. Unexpected stasis in a changing world: Lake nutrient and chlorophyll trends since 1990. *Global Change Biology* 23:5455-5467. DOI: 10.1111/gcb.13810

Soranno, P.A. and 79 others listed alphabetically including **S.M. Collins**. 2017. LAGOS-NE: A multi-scaled geospatial and temporal database of lake ecological context and water quality for thousands of U.S. lakes. *Gigascience* 6: 1-22. DOI: 10.1093/gigascience/gix101

Warren, D.R., **S.M. Collins**, E.M. Purvis, M.J. Kaylor and H.A, Bechtold. 2017. Spatial variability in light yields co-limitation of primary production by both light and nutrients in a forested stream ecosystem. *Ecosystems* 20: 198-210. DOI: 10.1007/s10021-016-0024-9

Collins, S.M., J.P. Sparks, S.A. Thomas, S.A. Wheatley and A.S. Flecker. 2016. Increased light availability reduces the importance of bacterial carbon in headwater stream food webs. *Ecosystems* 19: 396-410. DOI: 10.1007/s10021-015-9940-3

Collins, S.M., S.A. Thomas, T. Heatherly II, K.L. MacNeill, A.O.H.C. Leduc, A. Lopez-Sepulcre, B. Lamphere, R.W. El-Sabaawi, C.M. Pringle, D.N. Reznick, and A.S. Flecker. 2016. Fish introductions and light modulate food web fluxes in tropical streams: a whole-ecosystem experimental approach. *Ecology* 97: 3154-3166. DOI: 10.1002/ecy.1530

Collins, S.M., T.J. Kohler, S.A. Thomas, W.W. Fetzer and A.S. Flecker. 2016. The importance of terrestrial subsidies in stream food webs varies along a stream size gradient. *Oikos* 125: 674-685. DOI: 10.1111/oik.02713

Yuan, S., P.N. Tan, K.S. Cheruvelil, **S.M. Collins** and P.A. Soranno. 2015. Constrained spectral clustering for regionalization: Exploring the trade-off between spatial contiguity and landscape heterogeneity. *IEEE International Conference on Data Science and Advanced Analytics*. DOI: 10.1109/DSAA.2015.7344878

Soranno, P.A., E.G. Bissell, K.S. Cheruvelil, S.T. Christel, **S.M. Collins**, C.E. Fergus, C.T. Filstrup, J.F. Lapierre, N.R. Lottig, S.K. Oliver, C.E. Scott, N.J. Smith, S. Stopyak, S. Yuan, M.T. Bremigan, J.A. Downing, C. Gries, E.N. Henry, N.K. Skaff, E.H. Stanley, C.A. Stow, P.N. Tan, T. Wagner and K.E. Webster. 2015. Building a multi-scaled geospatial temporal ecology database from disparate data sources: Fostering open science through data reuse. *GigaScience* 4:28. DOI: 10.1186/s13742-015-0067-4

Dodds, W.K., **S.M. Collins**, S.K. Hamilton, J.L. Tank, S. Johnson, J.R. Webster, K.S. Simon, M.R. Whiles, H.M. Rantala, W.H. McDowell, S.D. Peterson, T. Riis, C.L. Crenshaw, S.A. Thomas, P.B. Kristensen, B.M. Cheever, A.S. Flecker, N.A. Griffiths, T. Crowl, E.J. Rosi-Marshall and R. El-Sabaawi. 2014. You are not necessarily what we think you eat: selective assimilation across multiple whole-stream isotopic tracer studies. *Ecology* 95: 2757-2767. DOI: 10.1890/13-2276.1

Collins, S.M., N. Bickford, P.B. McIntyre, A. Coulon, A.J. Ulseth, D.C. Taphorn and A.S. Flecker. 2013. Population structure of a Neotropical migratory fish: contrasting perspectives from genes and otolith microchemistry. *Transactions of the American Fisheries Society* 142: 1192-1201. DOI: 10.1080/00028487.2013.804005

Molecular Ecology Resources Primer Development Consortium and 33 others, including **S.M. Collins**. 2011. Permanent Genetic Resources added to Molecular Ecology Resources Database 1 June 2011- 31 July 2011. *Molecular Ecology Resources* 11: 1124-1126. DOI: 10.1111/j.1755-0998.2011.03068.x

Capps, K.A., M.T. Booth, **S.M. Collins**, M.A. Davison, J.M. Moslemi, R.W. El-Sabaawi, J.L. Simonis and A.S. Flecker. 2011. Nutrient diffusing substrata: a field comparison of commonly used methods to assess nutrient limitation. *Journal of the North American Benthological Society* 30: 522-532. DOI: 10.1899/10-146.1

Carey, C.C., M.P. Ching, **S.M. Collins**, A.M. Early, W.W. Fetzer, D. Chai and N.G. Hairston, Jr. 2011. Predator-dependent diel migration by Halocaridina rubra shrimp (Malacostraca: Atyidae) in Hawaiian Anchialine pools. *Aquatic Ecology* 45: 35-41. DOI: 10.1007/s10452-010-9321-0

PUBLICATIONS (IN REVIEW OR IN REVISION)

Narr, C.F., P. Chernyavskiy and **S.M. Collins**. *In Revision*. Partitioning macro- and microscale ecological processes using covariate-driven non-stationary spatial models. *Ecological Applications*, manuscript number EAP20-0635.

GRANTS AND AWARDS

Research & Travel Grants

- 2021-2024 National Science Foundation: RII Track-2 FEC: From genes to ecosystems: Harnessing elemental data to detect stoichiometric control-points and their consequences for organismal evolution. PI: J. Corman, co-PIs: E.K. Moody, H. M. Halvorson, C. Wagner, A. Krist, S.M. Collins, K. Anania, J.L. Clark, S.A. Thomas, M.S. Costanza-Robinson, C. Martinez del Rio, and E.M. Pierce. ($5,987,352)
- 2020-2024 National Science Foundation: RII Track-2 FEC: Highly predictive, explanatory models to harness the life science data revolution. PI: C.A. Buerkle, co-PIs: J. Blaszczak, S. Collins, M. Forister, R. Hall, D. Laughlin, L. Shoemaker, C. Weiss-Lehman, ($5,958,832).
- 2020-2023 Wyoming Department of Health and Wyoming Public Health Laboratory: Sampling wastewater influent as a surveillance tool for the presence of SARS-CoV-2 in Wyoming communities. PI: B. Bisha, co-PI: S. Collins, ($800,000)

- 2020-2022: EPSCoR Micro Project Seed Grant: Taxonomy and drivers of harmful cyanobacterial blooms in Wyoming reservoirs: PI: S. Collins, co-PIs: P. Ayayee, W. Fetzer, L. Patterson, M. Ross and A. Walters, ($49,950)
- 2020-2023: Wyoming Water Research Program: Identifying, predicting and managing the occurrence of harmful cyanobacterial blooms in Wyoming reservoirs. PI: S. Collins, co-PIs: W. Fetzer, L. Patterson, M. Ross, A. Walters, ($243,888)
- 2020-2021: College of Arts and Sciences Faculty Research Grant: Interactive effects of temperature and nutrient availability on aquatic microbial communities. PI: S. Collins, co-PIs: K. Jorgenson and K. Ruehling, ($3,990)
- 2020-2021: Meg and Bert Raynes Wildlife Fund: The role of food web structure and resource availability in providing refugia for threatened alpine stream macroinvertebrates. PI: S. Collins on behalf of my graduate student Karen Jorgenson, ($4,010)
- 2019-2022: Wyoming Water Research Program: Understanding the contributions of different microbial sources to surface water for informed management of waterborne pathogens in Wyoming. PI: S. Collins, co-PI: B. Bisha, ($210,435)
- 2018-2019: UW Arts & Sciences Seed Grants: Water quality in North American lakes: partitioning macro- and micro-scale ecological processes using non-stationary spatial models. PI: P. Chernyavskiy, co-PI: S. Collins, ($18,000)
- 2016-2021: National Science Foundation Macrosystems Biology: Collaborative research MSB-FRA: A macrosystems ecology framework for continental-scale prediction and understanding of lakes, NSF #1638679, lead PI: P.A. Soranno and 14 collaborators, S. Collins is Senior Personnel. ($4,257,250)
- 2016-2020: Academy of Finland. Project title: "The ecosystem effects of a rapidly evolving invader: A novel framework for the experimental study of nutrient fluxes", PI: A. Lopez-Sepulcre, co-PIs: S. Collins, R. El-Sabaawi, S. Thomas. (€455,810)
- 2015: Conference on Biological Stoichiometry Travel Grant ($400)
- 2012-2014: National Science Foundation Doctoral Dissertation Improvement Grant ($14,652)
- 2008-2013: Cornell Graduate School Conference Grants (7 awards, total $2,765)
- 2011: Orenstein Fund Award for travel to Norway ($700)
- 2008-2010: Kieckhefer Adirondack Fund (3 awards, total $13,000)
- 2008-2010: Biogeochemistry and Environmental Biocomplexity NSF IGERT Small Grants (4 awards, total $14,500)
- 2010: Cornell Graduate School Research Travel Grant ($1,800)
- 2010: Einaudi Center International Research Travel Grant ($400)
- 2008: Cornell Chapter of Sigma Xi ($800)
- 2006: Lewis & Clark College Student Academic Affairs Board Research and Conference Grants, total ($2,430)

Fellowships

- National Science Foundation Postdoctoral Research Fellowship in Biology ($207,000), 2014-17
- Andrew and Margaret Paul Graduate Fellow ($11,000), 2010
- National Science Foundation Graduate Research Fellowship Honorable Mention, 2008-09
- Cornell Fellowship ($22,000), 2007-08
- Barbara Neeley Scholarship for 4 years full tuition, Lewis & Clark College, 2003-2007

Awards

- Top Prof Award, 2019
- Outstanding Teaching Assistant, Cornell University College of Agriculture and Life Sciences, 2013
- North American Benthological Society President's Award, 2011
- Biology Award for Outstanding Graduate, Lewis & Clark College, 2007
- Phi Beta Kappa, 2007

TEACHING EXPERIENCE

University of Wyoming, Laramie, WY

Instructor for ECOL 5620: Advanced Topics in Ecology 2021
Instructor for ZOO 4440 and 4430: Limnology and Limnology Lab 2018-2020
Instructor for ZOO 5890: Seminar in Aquatic Ecosystems and Global Change 2020

Michigan State University, East Lansing, MI

Instructor for FW 472: Limnology 2016
Guest Lecturer for FW 474: Field and Laboratory Techniques for Aquatic Studies 2014
Teaching Development Activities 2014-2016

- Certificate in Scientific Teaching
- MSU Teaching Essentials: Introducing models to the classroom using technology, Student grievances, Race matters, Active learning, Learning management systems, Assessment.
- Lily Teaching Workshop: Cooperative learning

Cornell University, Ithaca, NY

Teaching Assistant 2008 - 2013

- Evolutionary Biology and Diversity (BioEE 1780), Ecosystem Biology and Global Change (BioEE 4780), Ecology and the Environment (BioEE 1610), Stream Ecology (BioEE 4560),

Guest Lecturer 2011-2013

- Ecosystem Biology and Global Change (BioEE 4780), Stream Ecology (BioEE 4560)

MENTORING EXPERIENCE

University of Wyoming, Laramie, WY

Mentor and Supervisor for graduate and undergraduate students 2018-present

- Advisor for four MS students, one PhD student, and one postdoctoral researcher, committee member for four additional MS or PhD students
- Supervisor for two undergraduate independent study projects

Cornell University, Ithaca, NY

Co-director for Biology Research Fellowship Program 2011-2013

- Directed NSF-funded summer research program for underrepresented students in the biological sciences for three years. Led research training and professional development seminars to prepare students for graduate school

Mentor and Supervisor for undergraduate field and laboratory technicians 2008-2014

- 20 undergraduate or post-graduate students assisted with the field and laboratory components of my dissertation research

INVITED SEMINARS

2018 University of South Carolina, Department of Biological Sciences

2018 University of Wyoming, Department of Zoology and Physiology

2018 University of Florida, Department of Biology

2017 St. Olaf College, Department of Biology

2016 Reed College, Biology Department

2014 Michigan State University, Ecology, Evolutionary Biology, and Behavior

2014 Michigan State University, Department of Fisheries and Wildlife

2014 Cornell University, Ecology and Evolutionary Biology Department

2007 Lewis & Clark College Biochemistry and Molecular Biology Department

Selected Conference Presentations

Collins, S.M., P. Chernyavskiy, C.F. Narr, and M.A. Tellier. 2019. Water quality in North American lakes: Partitioning macro- and micro-scale ecological processes using non-stationary spatial models. Society for Freshwater Science, Salt Lake City, UT.

Collins, S.M., E. Schliep, N. Lottig, and E.H. Stanley. 2018. Macroscale drivers of nitrogen cycling in lakes. Association for the Sciences of Limnology and Oceanography Summer Meeting, Victoria, BC.

Collins, S.M., S. Yuan, P.N. Tan, S.K. Oliver, J.F. Lapierre, K.S. Cheruvelil, C.E. Fergus, N.K. Skaff, J. Stachelek, T. Wagner, and P.A. Soranno. 2018. Winter precipitation and summer temperature predict lake ecosystem properties at macroscales. Society for Freshwater Science, Detroit, MI.

Collins, S.M., K.S. Cheruvelil, C.E. Fergus, J.F. Lapierre, S.K. Oliver, N.K. Skaff, P.A. Soranno, J. Stachelek, P.N. Tan, S. Yuan and T. Wagner. 2017. Which measures of climate are the best predictors of lake water quality at sub-continental scales? Ecological Society of America Annual Meeting, Portland, OR.

Collins, S.M., S.K. Oliver, J.F. Lapierre, E.H. Stanley, J.R. Jones, T. Wagner, and P.A. Soranno. 2016. What drives lake nitrogen and phosphorus concentrations at continental scales, and why is it so hard to explain nutrient ratios? Association for the Sciences of Limnology and Oceanography Summer Meeting, Santa Fe, NM.

Collins, S.M., S.K. Oliver, J.F. Lapierre, E.H. Stanley, K.S. Cheruvelil, P.A. Soranno, CSI Limnology Research Team. 2015. Integrating a spatial dimension into the relationship between landscape and lake chemistry though the use of a large, multi-themed database. American Geophysical Union Annual Meeting, San Francisco, CA (invited talk)

Collins, S.M., R.W. El-Sabaawi, T.N. Heatherly, B. Lamphere, A. Leduc, A. Lopez-Sepulcre, K.L. MacNeill, S.A. Thomas and A.S. Flecker. 2015. Fish introductions and light availability modulate food web fluxes in tropical streams. Oral Presentation at the Ecological Society of America Annual Meeting, Baltimore, MD.

Collins, S.M., S.K. Oliver, J.F. Lapierre, E.H. Stanley and P.A. Soranno. 2015. Macroscale patterns in lake N:P stoichiometry: influence of multiple landscape drivers. Poster Presentation at the Conference on Biological Stoichiometry, Peterborough, Ontario.

Collins, S.M., T. Kohler, S.A. Thomas, W.W. Fetzer and A.S. Flecker. 2015. The importance of terrestrial subsidies in stream food webs varies along a stream size gradient. Oral Presentation at the Society of Freshwater Science Annual Meeting, Milwaukee, WI.

Collins, S.M., S.A. Thomas and A.S. Flecker. 2013. Examining the role of bacteria in food webs using a dual-isotope tracer approach. Oral Presentation at the Ecological Society of America Annual Meeting, Minneapolis, MN.

Collins, S.M., J.M. Lauletta and A.S. Flecker. 2013. Evaluating resource use on a stream size gradient using isotopic and genetic approaches. Oral Presentation at Society for Freshwater Science Annual Meeting, Jacksonville, FL.

Collins, S.M., S.A. Thomas, K.L. MacNeill, T.N. Heatherly, A.S. Flecker. 2012. Examining the role of bacteria in stream food webs using a dual-isotope tracer approach. Oral Presentation at Biogeomon 2012: the 7th International Symposium on Ecosystem Behavior, Northport, ME.

Collins, S.M., N. Bickford, P.B. McIntyre, A. Coulon, A.J. Ulseth and A.S. Flecker. 2011. Genetic and microchemical analysis of population structure in a migratory Neotropical fish. Oral Presentation at the American Fisheries Society Annual Meeting, Seattle, WA.

Popular Writing

"At home underwater and on land: A conversation with Dr. Mary Power," *Scientific American*, 20 April 2012. http://blogs.scientificamerican.com/guest-blog/2012/04/20/at-home-underwater-and-on-land-a-conversation-with-dr-mary-power/

"Energy flow between stream and forest," *Oikos Journal Blog*, 02 October 2015. http://www.oikosjournal.org/blog/energy-flow-between-stream-and-forest

Other Skills

Proficient in Spanish, conversational in Swahili, certified SCUBA diver (PADI Advanced Open Water and Rescue Diver), experienced working in remote field conditions, field research experience in Montana, Kenya, Tanzania, Florida, Hawaii, New York, Trinidad and Tobago

Memberships and Service

Society Memberships

- American Geophysical Union (2015-present)
- Ecological Society of America (2007–present)
- Association for the Sciences of Limnology and Oceanography (2014-present)
- Society for Freshwater Science (2007-present)
- American Fisheries Society (2019-present)

Reviewer

- Manuscript reviews: Ambio, Biotropica, Canadian Journal of Fisheries and Aquatic Science, Conservation Genetics, Ecological Applications, Ecological Monographs, Ecology, Ecology Letters, Ecosystems, Environmental Science and Technology, Food Webs, Freshwater Biology, Freshwater Science, Frontiers in Ecology and Environment, Functional Ecology, Hydrobiologia, Journal of Geophysical Research - Biogeosciences, Lake and Reservoir Management, Landscape Ecology, North American Journal of Fisheries Management, Oecologia, Restoration Ecology
- Grant reviews: Biogeochemistry and Environmental Biocomplexity Small Grants, Cornell Sigma Xi Chapter Research Grants, National Science Foundation, Society for Freshwater Science Undergraduate Travel Grants and Instars Travel Grants, University of Wyoming Zoology and Physiology fellowships

Committee Work

- Steering committee, UW Ecology and Biogeochemistry Core Facility
- Steering committee, UW Stable Isotope Facility
- Members in Course committee, UW Phi Beta Kappa
- Faculty Advisor, Fish n' Chicks UW women's fly fishing club
- Member, Colorado Wyoming Chapter of the American Fisheries Society Diversity and Inclusivity Committee
- Member, UW Zoology and Physiology Graduate Advisory Board

Updated January 2021