
Garrett W. Hopper

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EDUCATION

Ph.D. Biology, Kansas State University, 2019
M.S. Biology, Kansas State University, 2015
B.S. Natural Resource Ecology and Management, Oklahoma State University, 2013

APPOINTMENTS:

2023 - Assistant Professor, School of Renewable Natural Resources, Louisiana State University and Agricultural Center
2019-2023 Postdoctoral Researcher, Dept of Biological Sciences, University of Alabama
2015-2019 Graduate Research Assistant, Division of Biology, Kansas State University
2013-2015 Graduate Teaching Assistant, Division of Biology, Kansas State University
2015 Research Technician, Division of Biology, Kansas State University
2012-2013 Undergraduate Research Technician, Oklahoma State University
2011-2012 Seasonal Fisheries Technician, Oklahoma Dept. Wildlife Conservation
2009-2012 Research Technician, USDA Ag. Research Services, Stillwater, OK

COURSES TAUGHT:

Biology of Fishes, Louisiana State University
Ichthyology, Louisiana State University
Fisheries Management and Techniques (TA), Kansas State University
Organismic Biology (TA), Kansas State University (5 semesters)
Fish Ecology (TA), Kansas State University
Principles of Biology (TA), Kansas State University (3 semesters)
Environmental Physiology (TA), Oklahoma State University
General Ecology (TA), Oklahoma State University
Introductory Biology (TA), Oklahoma State University

GRADUATE STUDENTS:

Jake Duhé (Current MS); Madison Kuczek (Current M.S.)

GRADUATE STUDENT SUPERVISORY COMMITTEES:

Lauren Morris (PhD University of Alabama, in progress)

PEER REVIEWED PUBLICATIONS:

- Lopez, J. W., A. Burrow, W. R. Haag, **G. W. Hopper**, C.L. Atkinson. 2024. Secondary production and biomass in freshwater mussel assemblages is related to species richness and stream size but not life history strategy composition. *Ecosphere*.
- Kubala, M.E., **G.W. Hopper**, I. Sánchez González, C. R. Jackson, C. L. Atkinson. (2024) Freshwater mussels enhance sediment N-removal potentials and alter sediment bacterial communities via nutrient release and bioturbation. *Freshwater Science*. 43 (4)
- Dubose, T.P., C.C. Vaughn, **G.W. Hopper**, K.B. Gido, T.B. Parr. 2024. Freshwater mussels engineer macroinvertebrate habitat through different mechanisms at different spatial scales. *Hydrobiologia*.
- Hopper, G.W.**, E. Miller, W.R. Haag, C.C. Vaughn, D.J. Hornbach, J.W. Jones, C.L. Atkinson. 2024. A test of the loose-equilibrium concept with long-lived organisms: evaluating temporal change in freshwater mussel assemblages. *Journal of Animal Ecology*. 93 (3): 281-293
- Hopper, G.W.**, J.R. Bucholz, T.P. Dubose, K.J. Fogelman, M.E. Kubala, Sean M. Keogh, M.B. Lodato, D.H. Nichols, I. Sánchez González, J.M. Pfeiffer, J.A. Stoeckel, J.D. Lozier, C.L. Atkinson. 2023. A trait database for freshwater mussels of the United States of America. *Scientific Data*. 10, 745.
- Hopper, G.W.**, I. Sánchez González, J.R. Bucholz, J.D. Lozier, C.L. Atkinson. 2023. Different components of biodiversity mediate two ecosystem functions derived from naturally assembled filter-feeder communities. *Oikos*. e09699.
- Bucholz, J.R., **G.W. Hopper**, I. Sánchez González, T.K. Kelley, C.R. Jackson, R.C. Garrick, C. L. Atkinson, J. D. Lozier. 2023. Community-wide correlations between species richness, abundance, and population genomic diversity in a freshwater biodiversity hotspot. *Molecular Ecology*.
- Sánchez González, I, **G.W. Hopper**, J.R. Bucholz, M.E. Kubala, J.D. Lozier, C.L. Atkinson. 2023. Species niche specialization and community niche space increase with species richness in filter-feeder communities. *Ecosphere*. e4495
- Hopper, G.W.**, K. B. Gido. C.C. Vaughn. 2023. Indirect functional effects of neighbors could not overcome density-dependent limited growth of a grazing minnow. *Food Webs*. e00277
- Atkinson, C.L., **G. W. Hopper**, D.A. Kreeger, J.W. Lopez, A.N. Maine, B.J. Sansom, A.N. Schwalb, C.C. Vaughn. 2023 Gains and gaps in knowledge surrounding freshwater mollusk ecosystem services. *Freshwater Mollusk Biology and Conservation*.

- Gido, K.B., S.C. Hedden, L.A. Bruckerhoff, C.A. Pennock, C.K. Hedden, **G.W. Hopper**, E.A. Renner, E.R. Johnson, B. Postlethwait. 2023. A perched culvert and natural obstructions limit fish dispersal in an intermittent prairie stream. *Freshwater Science*. 42 (1)
- Hopper, G.W.**, J. Buchanan, I. Sánchez González, M. E. Kubala, J.R. Bucholz, M. Lodato, J.D. Lozier, C. L. Atkinson. 2022. Little clams with big potential: nutrient release by *Corbicula fluminea* can exceed that of co-occurring freshwater mussel (Unionidae) assemblages *Biological Invasions*. 24: 2529-2545
- Kelley, T.K., **G.W. Hopper**, I. Sánchez González, J.R. Bucholz, C.L. Atkinson. 2022. Identifying potential drivers of distribution patterns of *Corbicula fluminea* relative to native freshwater mussels (Unionidae) across spatial scales. *Ecology and Evolution*. 12: 3 e8737
- Chiarello M, J.R. Bucholz, M. McCauley, S. Vaughn, **G.W. Hopper**, I. Sánchez González, C.L. Atkinson, J.D. Lozier, and C. Jackson. 2022. Environment and co-occurring native mussel species, but not host genetics, impact the microbiome of a freshwater invasive species (*Corbicula fluminea*). *Frontiers in Microbiology*. 13:800061
- Vaughn, C.C., T.B. Parr, T.P. Dubose, K.K. Gates, **G.W. Hopper**, K.B. Gido. 2021. Do mobile consumers homogenize the distribution of resources in stream food webs? A test with overlapping fish and mussel aggregations. *Freshwater Biology*. 67: 684-694
- Atkinson, C.L, M. Evans-White, H.M. Halvorson, **G.W. Hopper**, M.J. Vanni. 2021. Ecological stoichiometry in streams. In: Reference Module in Earth Systems and Environmental Sciences. <https://doi.org/10.1016/B978-0-12-819166-8.00082-7>
- Hopper, G.W.**, G.K. Dickinson, C.L. Atkinson. 2021. Associations among elements in freshwater mussel shells (Unionidae) and their relation to morphology and life history. *Freshwater Biology* 1980-1991.
- Sánchez González, I., **G.W. Hopper**, J.R. Bucholz, C.L. Atkinson. 2021. Long-term monitoring reveals differential responses of mussel and host fish communities in a biodiversity hotspot. *Diversity* 13 (3), 122-136. Special issue on Freshwater Mollusk Conservation
- Hopper, G.W.**, S. Chen, I. Sánchez González, J.R. Bucholz, Y. Lu, C.L. Atkinson. 2021. Aggregated filter-feeders govern the flux and stoichiometry of locally available energy and nutrients in rivers. *Functional Ecology* 35: 1183-1195
- Hopper, G.W.**, K.B. Gido, C.A. Pennock, S.C. Hedden, B.D. Frenette, N. Barts, C.K. Hedden, L.A. Bruckerhoff. 2020. Nowhere to swim: interspecific responses of prairie stream fishes in isolated pools during severe drought. *Aquatic Sciences* 82, 42

Hopper, G.W., K.B. Gido, C.A. Pennock, S.C. Hedden, J.P. Guinnip, M.A. Fisher, C.M. Tobler, C.K. Hedden, L.A. Bruckerhoff. 2020. Biomass loss and change in species dominance shift stream community excretion stoichiometry during severe drought. *Freshwater Biology* 65: 403-416

Hopper, G.W., T.P. Dubose, K.B. Gido, C.C. Vaughn. 2019. Freshwater mussels alter fish distribution at fine spatial scales through habitat modification. *Freshwater Science* 38: 702-712

Hopper, G.W. 2019. An observation of aquatic surface respiration by Central Stoneroller (*Campostoma anomalum*) in isolated pools during severe drought. *Transactions of the Kansas Academy of Sciences* 122: 264-266

Perkin J.S., T.A. Starks, C.A. Pennock, K.B. Gido, **G.W. Hopper**, S.C. Hedden. 2019. Extreme drought causes fish recruitment failure in a fragmented Great Plains riverscape. *Ecohydrology* e2120

Hopper, G.W., K.B. Gido, C.C. Vaughn, T.B. Parr, T.G. Popejoy, C.L. Atkinson, K.G. Gates. 2018. Biomass distribution of fishes and mussels mediates spatial and temporal heterogeneity in nutrient cycling in streams. *Oecologia* 188:1133-1144

Hopper, G.W., Morehouse, R.L., Tobler, M. 2017. Body shape variation in two species of darter (*Etheostoma*; Percidae) and its relation to the environment. *Ecology of Freshwater Fish* 26:4-18

Hopper, G.W. & M. Tobler. 2016. Patterns of diet variation and individual specialization in two species of darter (*Etheostoma*; Percidae). *Evolutionary Ecology Research* 17:53-73

MANUSCRIPTS UNDER REVIEW:

Siders, A. C., **G.W. Hopper**, M. R. Whiles, A. J. Reisinger, K. B. Gido. Drought-induced decreases in abundance of emergent midge subsidies offset by increased body size in a prairie stream. (Under Review at *Freshwater Biology*)

Hopper, G. W., J. M. Pfeiffer, A. J. Skorupa, P. D. Hazelton, C. L. Atkinson. Emerging patterns from the Mussel Host Database: strengths, weaknesses, opportunities, and threats for fish and mussel conservation. (Under Review at *Freshwater Science*)

Hopper, G. W., E. J. Miller, J. Hofmeier. Three decades of unionid mussel monitoring reveals improvements to most populations in a midwestern river. (Under review at *Freshwater Science*)

Kubala, M.E., **G.W. Hopper**, I. Sánchez González, C. R. Jackson, K. A. Kuehn, H.M. Halvorson, A.D. Huryn, C. L. Atkinson. Species identity and diversity of filter-feeding bivalves impacts green and brown food webs. (Under review at *Freshwater Biology*).

MANUSCRIPTS IN PREPARATION:

- Vaughn, S., J. Bucholz, I. Sánchez González, **G. W. Hopper**, P. D. Johnson, J. D. Lozier, C. L. Atkinson, C.R. Jackson. The gut microbiome of juvenile mussels is influenced by host development more than environmental conditions. (In prep)
- Zieritz, A., J. I. Brian, R. Sousa D. C. Aldridge, C. L. Atkinson, K. Douda, C. C. Vaughn, Y. Bepalaja, T. Blackwell, A. Crisp, **G. W. Hopper**, A. Cmiel, A. Dobler, J. Dołęga, F. Ercoli, E. B. Oliveira Esteves, J. Geist, I. Sánchez González, D. Halabowski, P. Hoos, H. Hyvärinen, M. Illarri, I. Lewin, A. Lipinska, J. Magerøy, D. Nizzoli, I. Ollard, M. Österling, N. Riccardi, S. Rock, N. Ferreira Rodriguez, T. Sjöberg, J. Taskinen, G. Urbanic, M. Urbanska, Q. Yu, A. S. Vaz. Freshwater bivalves exert significant global effects on some – but not all – ecological functions and regulating ecosystem services. (In prep for Nature Ecology and Evolution)
- Chiarello, M, M. McCauley, **G.W. Hopper**, J.D. Lozier, R. Garrick, I. Sánchez González, J.R. Bucholz, C.L. Atkinson, C.R. Jackson. Microbiome diversity relates to host species diversity in aquatic filter-feeders (Unionidae). (In prep for Nature Communications).
- Shockey, M. C, C. N. Jones, **G.W. Hopper**, C. L. Atkinson, C. L. Staudhammer, L. Davis. Using hydrogeomorphic characteristics to predict tree species distribution and ecosystem (in prep for Ecological Applications).
- Sánchez González, I. **G.W. Hopper**, J.R. Bucholz, J.D. Lozier, C.L. Atkinson. A functional morphological classification for North American Freshwater Mussels: Associations between morphology and environmental parameters across spatial scales. (In prep for Biological Reviews)
- Bucholz, J. R., **G. W. Hopper**, I. Sánchez González, C.R. Jackson, R.C. Garrick, C. L. Atkinson, J. D. Lozier. Multispecies genetic structure scales with beta diversity across river hierarchies in a freshwater mussel biodiversity hotspot. (In Prep for Nature Ecology and Evolution)
- Sánchez González, J.R. Bucholz, I. **G.W. Hopper**, J.D. Lozier, C.L. Atkinson. 3D morphometrics reveal patterns of Unionid shell morphological variation along hydrological gradients (In Prep for Journal of Biogeography)
- Bucholz, J. R., N. Johnson, K. Farleigh, **G. W. Hopper**, I. Sánchez González, C. L. Atkinson, J. D. Lozier. Genome-wide genetic structure of a widespread freshwater mussel genus reflects river biogeography (In Prep)
- Brunetz, I. A., J. W. Lopez, **G. W. Hopper**, I. Sánchez González, C. L. Atkinson. Variation in freshwater mussel growth rates across four rivers in explained by longevity but not hydrology. (In prep for Transactions of the American Fisheries Society).

AWARDS:

2022 Alabama Water Institute Travel Grant (\$1,000)

2019 Edler Award for Outstanding Research on The Konza Prairie (\$1,000)

2018 SWAN Student Field Natural History Award (\$1,000)
 2018 SWAN Wilks Award and Student Field Natural History Award Finalist (\$250)
 2018 Otto Teimeier-Frank Cross Award for Scholastic Achievement in Fisheries (\$300)
 2017 Kansas State University BGSA Travel Grant 2017 (\$1000)
 2016 Kansas Academy of Sciences Graduate Student Research Grant (\$1,500)
 2015-2019 Kansas State University Arts & Sciences Research Travel Grant (\$3,200)
 2015 and 2019 Kansas State University BGSA Finishing Grant (\$300)
 2009-2013 Oklahoma State University Academic Excellence Scholarship (\$21,000)

RESEARCH SUPPORT:

Louisiana Department of Wildlife and Fisheries. Jan. 2025-Dec. 2026. Assessing habitat connectivity in the Bayou Pierre watershed with emphasis on freshwater mussel assemblage structure. \$211,994.

The Joe and Dorothy Dorsett Brown Foundation, 2023 Basic Science Program: Agriculture. *Can freshwater mussels buffer the Gulf of Mexico from nutrient pollution? Quantifying nutrient cycling by native unionids in Louisiana.* \$115,000.

INVITED SEMINARS:

Emergent patterns from the Freshwater Mussel Host Database: Strengths, weaknesses, opportunities and threats for fish and mussel conservation. Louisiana State University Museum Seminar Series. 2023

Environmental context and species traits influence animal-mediated nutrient cycling in streams. School of Renewable Natural Resources, Louisiana State University 2022

Biology and Ecology of a fish-parasite relationship. School of Renewable Natural Resources, Louisiana State University 2022

Long-term trajectories reflect gradual, directional change for communities of freshwater mussels over decades. FMCS, Survey Guidelines and Techniques Workshop, Henry Horton State Park, Tennessee 2022.

Long-term trajectories for communities of mussels in three hydrologically variable rivers. Department of Biological Sciences, University of Alabama 2022.

Environmental context and species traits influence animal-mediated nutrient cycling in streams. Department of Biological Sciences, Emporia State University 2020.

PLATFORM PRESENTATIONS AS PRESENTING AUTHOR:

Hopper, G. W., J. M. Pfiesser, A. J. Skorupa, P. D. Hazelton, C. L. Atkinson. Emerging patterns from the Mussel Host Database: strengths, weaknesses, opportunities, and threats for fish and mussel conservation. Louisiana Chapter of AFS 2024.

Hopper, G. W., J. M. Pfiesser, A. J. Skorupa, P. D. Hazelton, C. L. Atkinson. Emerging patterns from the Mussel Host Database: strengths, weaknesses, opportunities, and threats for fish and mussel conservation. Southern Division of AFS 2024.

Hopper, G. W., E. Miller, W.R. Haag, D.J. Hornbach, J. Jones, C.C. Vaughn, C.L. Atkinson. Evaluating temporal change in freshwater mussel communities. Freshwater Mollusk Conservation Society 2023.

- Hopper, G. W.**, E. Miller, W.R. Haag, C.C. Vaughn, C.L. Atkinson. Long-term trajectories for communities of mussels in three hydrologically variable rivers. Joint Aquatic Sciences Meeting 2022.
- Hopper, G. W.**, J. R. Bucholz, T. P. Dubose, M. E. Kubala, M. Lodato, I. Sánchez González, J. M. Pfeiffer, J. D. Lozier, C. L. Atkinson. Mussel Traits: A database for North American freshwater mussels. Tennessee Mollusks and Crayfish Meeting 2021.
- Hopper, G. W.**, W. R. Haag, C. L. Atkinson. Gradual change of a mussel community (Unionidae) in a naturally variable river over two decades. The European Congress of Malacological Societies. 2021.
- Hopper, G.W.**, G.K. Dickinson, C.L. Atkinson. Shell collections as tools to uncover intra-guild diversity in elemental storage. Society for Freshwater Science 2021
- Hopper, G.W.**, S. Chen, I. Sánchez González, J. Bucholz, Y. Lu, C.L. Atkinson. Mussel bed assemblage structure governs the flux and stoichiometry of locally available energy and nutrients in rivers. FMCS 2021
- Hopper, G.W.**, S. Chen, I. Sánchez González, J. Bucholz, Y. Lu, C.L. Atkinson. Freshwater mussel assemblage structure influences the stoichiometry of excreted energy and nutrients in rivers. Society for Freshwater Science Summer of Science, 2020
- Hopper, G.W.** Mussel Dimensions of Biodiversity, Alabama Mollusk and Crayfish Meeting Huntsville, AL 2020.
- Hopper, G.W.**, S. Chen, I. Sánchez González, J. Bucholz, Y. Lu, C.L. Atkinson. Freshwater mussels as a source of bioavailable organic energy and nutrients. Alabama Water Institute – Tuscaloosa, AL, 2019
- Hopper, G.W.**, K.B. Gido, C.A. Pennock, S.C. Hedden, C.K. Hedden, C.M. Tobler, L.A. Bruckerhoff. Biomass loss and species turnover during severe drought shifts stream community excretion stoichiometry. Society for Freshwater Sciences. – Salt Lake City, UT 2019
- Hopper, G.W.**, K.B. Gido, C.A. Pennock, S.C. Hedden, B.D. Frenette, N Barts, C.K. Hedden, L.A. Bruckerhoff. Response of a local fish community to severe drought. Kansas Natural Resources Conference. - Manhattan, KS 2019
- Hopper, G.W.**, K.B. Gido, C.A. Pennock, S.C. Hedden, B.D. Frenette, C.K. Hedden, C.M. Tobler, L.A. Bruckerhoff. Short term effects of intense drought on a local stream community. Great Plains Limnology Conference- Lawrence, KS 2018
- Hopper, G.W.**, T.G. Popejoy, K.B. Gido, C.C. Vaughn. Do trophic subsidies and habitats provided by mussel attract fishes? Society for Freshwater Sciences– Detroit, MI 2018
- Hopper, G.W.**, T.G. Popejoy, K.B.Gido, C.C. Vaughn. Fine scale response of a fish assemblage to mussel derived resources subsidies. Southwestern Association of Naturalists. San Marcos, TX 2018.
- Hopper, G.W.**, T.G. Popejoy, K.B. Gido, C.C. Vaughn. Are fishes attracted to mussels? Kansas Natural resource Conference– Manhattan, KS 2018
- Hopper, G.W.**, K.B. Gido, C.C. Vaughn, T.B. Parr, K.G. Gates, C.L. Atkinson. Contributions of mussel and fish communities to nutrient dynamics. Society for Freshwater Sciences– Raleigh, NC 2017

Hopper, G.W., K.B. Gido, C.C. Vaughn, T.B. Parr, K.G. Gates, C.L. Atkinson. Contributions of mussel and fish assemblages as biogeochemical hotspots. Southern Division American Fisheries Society Annual Meeting – Oklahoma City, OK 2017

Hopper, G.W., K.B. Gido, C.C. Vaughn, K.G. Gates, C.L. Atkinson. Comparing the contribution of mussel and fish assemblages as biogeochemical hotspots. American Fisheries Society Annual Meeting – Kansas City, MO, 2016

Hopper, G.W., R.L. Morehouse, M. Tobler. Body shape variation in two species of darter (*Etheostoma*; Percidae) and its relation to the environment. KS AFS–Manhattan, KS 2015

COMMUNITY EDUCATION AND OUTREACH

BREC Zoo freshwater fishes exhibit, Baton Rouge, LA 2023

Meet a 'Bama Biologist Presenter (K-12) – "*Freshwater Mussels in Alabama*" 2021

University of Alabama, Homecoming- "*Can you name that mussel?*" 2019, 2021, 2022

Science Festival "*Why are freshwater fish so threatened?*"- Sunset Zoo 2019

Great Plains Nature Center- Senior Wednesday- "*The role of animals in stream food webs and nutrient cycling*". 2019

Science on Tap-Tallgrass Tap House - "*How drought impacts prairie stream fishes*" 2018

Contributor-*Kansas State Science Snapshots* (sciencesnapshots.com)

Sunset Zoo Science Communication Fellow 2017

Stream Research Development Workshop with Oklahoma's K20 Center 2017

Peer editor: NPR's Joe's Big Idea

AFFILIATIONS AND SERVICE

Alabama Water Institute

American Fisheries Society (AFS)

Freshwater Mollusk Conservation Society (FMCS)

Society for Freshwater Sciences (SFS)

Committees: UA Dept. of Biological Sciences: Diversity, Equity, and Inclusivity (DEI) Interim Committee member (2020), DEI journal club co-coordinator (2021-2022), Freshwater Mollusk Conservation Society: Ecosystem services committee (2020-); Mobile Basin State Wildlife Action Plan Review Committee, Mussels (2025).

Journal Referee: Aquatic Conservation: Marine and Freshwater Ecosystems, Canadian Journal of Fisheries and Aquatic Sciences, Aquatic Sciences, Ecology of Freshwater Fish, Ecosystems, Freshwater Biology (3), Freshwater Mollusk Biology and Conservation (4), Freshwater Science (6), Fundamental and Applied Limnology, Journal of Environmental Management, Kansas Academy of Sciences (3), International Journal of Hydrobiology (2), Proceedings of Royal Society B, Royal Society Open Science, Science of the Total Environment (2), Southwestern Naturalist (2), Wetlands Ecology and Management.

Judge: LSU Discover Day Student Poster Judge (2024); Graduate Student Platform Presentation SDAFS (2024), Student poster presentations JASM (2022), FMCS (2021, 2023), SFS (2017, 2018, 2019), Graduate Research Forum, University of Alabama (2019)
Session moderator: FMCS (2023) Southern Division of AFS (2016), SFS (2018-2019)
National Science Foundation Reviewer: 2023, 2024

References

Dr. Carla Atkinson, Department of Biological Sciences, University of Alabama, Beville Building, Tuscaloosa, AL, 35401. (205) 348-6805 **Email:** carla.l.atkinson@ua.edu
Website: <http://atkinsonlab.ua.edu/>

Dr. Keith Gido, Division of Biology, Kansas State University, Ackert Hall, Manhattan, KS, 66506. (785)-532-5088 **Email:** kgido@ksu.edu
Website: <https://ksufishecology.weebly.com/>

Dr. Caryn Vaughn, Oklahoma Biological Survey, Department of Biology, and Ecology and Evolutionary Biology Graduate Program, University of Oklahoma, 111 E. Chesapeake St., Norman, OK 73019. (405)744-9671 **Email:** cvaughn@ou.edu
Website: <http://carynvaughn.com/>