



# Shannon L. Speir, Ph.D.

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Assistant Professor of Water Quality  
Department of Crop, Soil, and Environmental Sciences  
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**Expertise:** Biogeochemistry of streams and rivers; impacts of agriculture and intermittency on water quality; nitrogen, phosphorus, and carbon cycling; denitrification; high-frequency sensors; water chemistry and membrane inlet mass spectrometry (MIMS) analyses

## Education:

University of Notre Dame (Notre Dame, IN) <i>Advisor: Dr. Jennifer Tank</i>	Biological Sciences	Ph.D., 2021
University of Arkansas (Fayetteville, AR) <i>Advisor: Dr. J. Thad Scott</i>	Crop, Soil, & Environmental Science	M.S., 2016
Texas Christian University (Forth Worth, TX) <i>Advisors: Drs. Matt Chumchal &amp; Ray Drenner</i>	Biology & Spanish Summa Cum Laude, Honors	B.S., 2014

## Appointments:

2022-present	Assistant Professor of Water Quality, University of Arkansas
2022-present	Environmental Dynamics Faculty, University of Arkansas
2021-2022	Postdoctoral Research Associate, The University of Alabama
2016-2021	Fellow, University of Notre Dame Notebaert Premier Scholarship
Spring 2021	Notre Dame CEST Pre-Doctoral Fellow
Fall 2020	Teaching Assistant, Stream Ecology
2019-2020	Research Assistant, NSF Smart & Connected Communities Grant
Spring 2019	Teaching Assistant, General Ecology
Fall 2018	Teaching Assistant, Stream Ecology
2017-2018	Research Assistant, USDA Regional Conservation Partnership Program Grant
2014-2016	Research Assistant, University of Arkansas
2012-2014	Undergraduate Research Assistant, Texas Christian University

## Peer-Reviewed Publications ([Google Scholar Page](#); mean IF =5.1) – listed in reverse chronological order

#Undergraduate Advisee

20. A.F. Hamlet, N. Ehsani, J.L. Tank, Z. Silver, K. Byun, U.H. Mahl, **S.L. Speir**, M.T. Trentman, T.V. Royer. 2024. Effects of climate and winter cover crops on nutrient loss in agricultural watersheds in the Midwestern U.S. *Climatic Change*.  
<https://doi.org/10.1007/s10584-023-03656-4>

19. **S.L. Speir\***, L.A. Rose\*, J.R. Blaszczak, D.W. Kincaid, H.M. Fazekas, A.J. Webster, M.A. Wolford, A.J. Shogren, A.S. Wymore. 2023. Catchment concentration-discharge relationship across temporal scales. *WIREs Water*. <https://doi.org/10.1002/wat2.1702>  
\*Co-first authors
18. **S.L. Speir**, C.N. Jones, A.J. Shogren, C.L. Atkinson. 2023. Uncertainty in streamflow measurements significantly impacts estimates of downstream nitrate export. *Environmental Research Letters*. <https://doi.org/10.1088/1748-9326/ad0ad2>
17. **S.L. Speir**, J.L. Tank, J.M. Taylor, A.L. Grose<sup>#</sup>. Temperature and carbon availability interact to enhance nitrous oxide production via denitrification in alluvial plain river sediments. *Biogeochemistry*. <https://doi.org/10.1007/s10533-023-01074-3>
16. A.S. Wymore, W. Larsen, D.W. Kincaid, K.L. Underwood, H.M. Fazekas, D.S. Murray, A.J. Shogren, **S.L. Speir**, A.J. Webster. Revisiting the origins of power-law analyses for the assessment of concentration-discharge relationships. *Water Resources Research*. <https://doi.org/10.1029/2023WR034910>
15. L. Shang, Y. Zhang, Q. Ye, **S.L. Speir**, B.W. Peters, Y. Wu, C.J. Stoffel, D. Bolster, J.L. Tank, D.M. Wood, N. Wei, D. Wang. 2023. CrowdWaterSens: An Uncertainty-aware Crowdsensing Approach to Groundwater Contamination Estimation. *Pervasive and Mobile Computing*. <https://doi.org/10.1016/j.pmcj.2023.101788>
14. L.R. Sethna, T.V. Royer, **S.L. Speir**, M.T. Trentman, U.H. Mahl, L.P. Hagemeyer, J.L. Tank. 2022. Silicon concentrations and stoichiometry in two agricultural watersheds: implications for management and downstream water quality. *Biogeochemistry*. 159, 265-282. <https://doi.org/10.1007/s10533-022-00927-7>
13. A. Ghosh, A. Robison, A. Chiapella, B. Bertolet, C. Selden, D. Perry, H. Reich, I. Oleksy, J. Isanta-Navarro, K. Aho, L. Ganley, L. Melo Vieira Soares, L. Heffernan, O. Peleg, P. Ramulifho, P. Thibodeau, P. Reis, M. Sasaki, N. Ray, R. Maher, R. LaBrie, **S.L. Speir\***. 2022. Eco-DAS: an effective platform for developing professional collaborations among early career aquatic scientists. *Limnology & Oceanography Bulletin*. 31(1), 27-29. <https://doi.org/10.1002/lob.10485>  
\*Author order determined alphabetically by first name.
12. A.L. Grose<sup>#</sup>, **S.L. Speir**, A.N. Thellman<sup>#</sup>, M.M. Dee, J.L. Tank. Differences in groundwater contributions to streamflow versus watershed NO<sub>3</sub><sup>-</sup>-N export reveal the importance of scale in evaluating agricultural conservation practices. *Hydrological Processes*. 36(2), e14476. <https://doi.org/10.1002/hyp.14476>
11. **S.L. Speir**, C.J. Stoffel, D. Bolster, J.L. Tank, L. Shang, D.M. Wood, B.W. Peters, N. Wei, D. Wang. 2022. Solutions to current challenges in widespread monitoring of groundwater quality via crowdsensing. *Groundwater*. 60(1), 15-24. <http://doi.org/10.1111/gwat.13150>
10. **S.L. Speir**, J.L. Tank, M.T. Trentman, U.H. Mahl, L.R. Sethna, T.V. Royer. 2022. Cover crops control nitrogen and phosphorus transport from two agricultural watersheds at multiple measurement scales. *Agriculture, Ecosystems & Environment*. 326, 107765. <https://doi.org/10.1016/j.agee.2021.107765>

9. **S.L. Speir**, J.L. Tank, M. Bieroza, U.H. Mahl, T.V. Royer. 2021. Storm size and hydrologic modification influence nitrate mobilization and transport in agricultural watersheds. *Biogeochemistry*. 156, 319-334. <https://doi.org/10.1007/s10533-021-00847-y>
8. B.R. Hanrahan, J.L. Tank, **S.L. Speir**, M.T. Trentman, S.F. Christopher, U.H. Mahl, T.V. Royer. 2021. Extending vegetative cover with cover crops influenced phosphorus loss from an agricultural watershed. *Science of the Total Environment*. 801. <https://doi.org/10.1016/j.scitotenv.2021.149501>
7. J.L. Tank, **S.L. Speir**, L.R. Sethna, T.V. Royer. 2021. The case for studying highly modified agricultural streams: Farming for biogeochemical insights. *Limnology and Oceanography Bulletin*. 30(2), 41-47. <https://doi.org/10.1002/lob.10436>
6. M.T. Trentman, J.L. Tank, T.V. Royer, **S.L. Speir**, U.H. Mahl, L.R. Sethna. 2020. Cover crops and precipitation influence soluble reactive phosphorus losses via tile drain discharge in an agricultural watershed. *Hydrological Processes*. 34(23), 4446-4458. <https://doi.org/10.1002/hyp.13870>
5. **S.L. Speir**, J.L. Tank, U.H. Mahl. 2020. Quantifying denitrification following floodplain restoration via the two-stage ditch in an agricultural watershed. *Ecological Engineering*. 155. <https://doi.org/10.1016/j.ecoleng.2020.105945>
4. J.M. Taylor, M. Moore, **S.L. Speir**, S. Testa III. 2020. Vegetated ditch habitats provide net nitrogen sink and phosphorus storage capacity in agricultural drainage networks despite senescent plant leaching. *Water* 12(3). <https://doi.org/10.3390/w12030875>
3. A.J. Shogren, J.L. Tank, E.J. Rosi, M.M. Dee, **S.L. Speir**, D. Bolster, S.P. Egan. 2019. Transport and instream removal of the Cry1Ab protein from genetically engineered maize is mediated by biofilms in experimental streams. *PloS one* 14(5). <https://doi.org/10.1371/journal.pone.0216481>
2. **S.L. Speir**, J.M. Taylor, and J.T. Scott. 2017. Seasonal differences in relationships between nitrate and denitrification rates in ditch sediments vegetated with rice cutgrass (*Leersia oryzoides*). *Journal of Environmental Quality* 46(6), 1500-1509. <https://doi.org/10.2134/jeq2016.11.0450>
1. **S.L. Speir**, M.M. Chumchal, R. Drenner, W.G. Cocks, M. Lewis, and H.M. Whitt. 2014. Methylmercury and stable isotopes of nitrogen reveal that a terrestrial spider has a diet of emergent aquatic insects. *Environmental Toxicology and Chemistry* 33(11), 2506-2509. <https://doi.org/10.1002/etc.2700>

*In Review/Revision:*

1. **S.L. Speir**, J.L. Tank, A. Pastor, M.F. Müller, M. Mastepanov, T. Riis. Climate-induced land cover change alters long-term riverine nitrogen export in Northeast Greenland. *In review with Environmental Research Letters*.
2. **S.L. Speir**, J.L. Tank, U.H. Mahl, L. Li, T.V. Royer. Cation-mediated effects of cover crops enhance retention of soil phosphorus on the agricultural landscape. *In review with Agriculture, Ecosystems & Environment*.

3. **S.L. Speir**, J.L. Tank, M.T. Trentman, M.M. Dee, A.J. Shogren. Environmental context differentially influences nitrogen and phosphorus uptake in experimental streams. *In review with Freshwater Science*.

In preparation for submission in 2024:

1. **S.L. Speir**, M.A. Wolford, A.G. Strauss, D.M. Peterson, C.R. Smith, C.L. Atkinson. Spatial variation in sediment export is linked to watershed attributes in non-perennial streams in Alabama, USA. *In preparation for Water Resources Research*.
2. **S.L. Speir**, A.G. Strauss, I. Tamayo<sup>#</sup>. Decadal changes in streamflow delivery to Beaver Lake Reservoir enhance risk of eutrophication. *In preparation for Hydrological Processes*.
3. A.G. Strauss, **S.L. Speir**, L.A. Shepard<sup>#</sup>. Cover crops reduce edge-of-field sediment and phosphorus loss on Arkansas Discovery Farms. *In preparation for Journal of Environmental Quality*.

### **Extension Publications**

1. A.G. Strauss, **S.L. Speir**, M.B. Daniels. 2024. Why is Stream Water Quality Important?. FSA9544. <https://www.uaex.uada.edu/publications/PDF/FSA9544.pdf>

### **Funding (Total Funding = \$1,067,644; Total Pending = \$559,604):**

Funded Grants (Total = \$558,111; Lead PI = 7 grants, Co-PI = 2 grant)  
Listed in reverse chronological order

9. *Cooperative agreement for LGU GHP activities through SERA-46*. Submitted to the Environmental Protection Agency Gulf Hypoxia Program. K. Genskow listed as lead PI, **Speir listed as Co-PI**. Total amount funded: \$600,000. Amount to Speir: **\$150,000**. Awarded March 2024.
8. *Integrating watershed expansion-contraction dynamics into cross-continental watershed hydrobiogeochemical predictions*. Submitted to the Department of Energy EPSCoR Program. A. Webster listed as lead PI, **Speir listed as Co-PI**. Total amount funded: \$2,498,812. Amount to Speir: **\$329,599**. Awarded July 2023.
7. *Quantifying watershed-scale responses to conservation in an agricultural watershed dominated by poultry and livestock production*. Submitted to the Arkansas Agricultural Experiment Station Research Innovation Grant Program. **Speir listed as sole PI**. Amount to Speir: **\$30,000**. Awarded June 2023.
6. *Quantifying watershed-scale responses to conservation in three agricultural watersheds dominated by poultry and pasture-raised livestock production*. Submitted to the US Geological Survey 104B Program. **Speir listed as sole PI**. Amount to Speir: **\$20,000**. Awarded September 2022.
5. *The effects of temperature, carbon, and nitrate concentrations on nitrous oxide production via denitrification in alluvial plain river sediments*. Submitted to the Notre Dame Center for Environmental Science and Technology Fellowship Program. **Speir listed as sole PI**. Amount to Speir: **\$11,646**. Awarded May 2020

4. *Using high-frequency, real-time nitrate data to understand the potential for cover crops to improve storm resiliency in the face of a changing climate.* Submitted to the USDA North Central Sustainable Agriculture Research and Education (SARE) Graduate Student Grant Program. **Speir listed as lead PI.** Amount to Speir: **\$13,351.** Awarded July 2019.
3. *Examining environmental controls on N<sub>2</sub>O yields via denitrification in stream sediments using a novel application of membrane inlet mass spectrometry (MIMS).* Submitted to the Notre Dame Graduate School Professional Development Research Grant Program. **Speir listed as sole PI.** Amount to Speir: **\$515.** Awarded July 2019.
2. *Partitioning the uptake of dissolved inorganic nitrogen via assimilatory and dissimilatory processes in streams at ND-LEEF.* Submitted to the Notre Dame Environmental Change Initiative's ND-LEEF Research Grant Program. **Speir listed as lead PI.** Amount to Speir: **\$1,500.** Awarded May 2018.
1. *Determination of methyl mercury (MeHg) movement between aquatic and terrestrial ecosystems via stable isotope analysis.* Submitted to the TCU Science and Engineering Research Center (SERC) Grant Program. **Speir listed as lead PI.** Amount to Speir: **\$1,500.** Awarded May 2012.

Funded Student Mentee Grants (Total = \$23,500)

1. *Influence of seasonal temperature and flow variation on nitrogen and phosphorus uptake in the Upper White River, AR.* Funded by the Bumpers College Undergraduate Research and Creative Grants Program. Amount: **\$1,000.** Awarded to J.E. Todd in January 2023.
2. *Quantifying spatiotemporal phosphorus dynamics in two agricultural watersheds with varying levels of poultry and livestock production.* Funded by the Bumpers College Undergraduate Research and Creative Grants Program. Amount: **\$1,000.** Awarded to J.L. Major in January 2023.
3. *Quantifying spatiotemporal phosphorus dynamics in two agricultural watersheds with varying levels of poultry and livestock production.* Funded by the University of Arkansas Office of Undergraduate Research. Amount: **\$5,500.** Awarded to J.L. Major in January 2023.
4. *Assessing the efficacy of stream restoration on Mullins Creek ten years post-implementation.* Funded by the Bumpers College Undergraduate Research and Creative Grants Program. Amount: **\$750.** Awarded to D. Scott in May 2023.
5. *Quantifying freshwater salinization impacts on nitrate removal via denitrification in urban streams.* Funded by the Bumpers College Undergraduate Research and Creative Grants Program. Amount: **\$750.** Awarded to B.N. Beck in November 2023.
6. *The effect of common road salts and organic additives on microbial respiration in two urban streams.* Funded by the Bumpers College Undergraduate Research and Creative Grants Program. Amount: **\$750.** Awarded to C.M. Meara in November 2023.
7. *The effect of common road salts and organic additives on microbial respiration in two urban streams.* Funded by the Arkansas Division of Higher Education Student Undergraduate Research Fellowship (SURF) Program. Amount: **\$5,500.** Awarded to C.M. Meara in December 2023.

8. *Quantifying freshwater salinization impacts on nitrate removal via denitrification in urban streams.* Funded by the University of Arkansas Honors College Program. Amount: **\$5,500.** Awarded to B.N. Beck in December 2023.
9. *Nutrient uptake as a tool for evaluating post-restoration status of Mullins Branch, AR.* Funded by the University of Arkansas Office of Undergraduate Research. Amount: **\$2,750.** Awarded to J.E. Todd in December 2023.

Other funding (Total = \$486,033) – listed in reverse chronological order

Aug 2023	SEC Faculty Travel Award (\$909)
Nov 2021	Alabama Water Institute Equipment Funds (\$9,215.44)
Sept 2019	ND Rapid Exposure to Advanced Computational Training (REACT; \$1,148.24)
April 2019	ND Graduate School Professional Development Travel Grant (\$741.93)
April 2019	ND Graduate Student Union Conference Presentation Grant (\$100)
March 2018	Society for Freshwater Science General Endowment Award (\$1,000)
Nov 2017	CUAHSI Student Travel Grant (\$500)
Oct 2017	WaterSmart Innovations Student Travel Grant (\$1,300)
Jan 2017	ND Department of Biological Sciences Travel Grant (\$500)
Dec 2016	Cary Institute Fundamentals of Ecosystem Ecology Scholarship (\$1,000)
Sept 2016	ND Notebaert Premier Fellowship (\$459,618)
June 2014	Big XII Dr. Prentice Gautt Postgraduate Scholarship (\$10,000)

Pending Proposals (Lead PI = 2 grants; Co-PI = 2 grants)

1. *Monitoring Sediment Transport from Unpaved Roads in Brush Creek.* Submitted to the Environmental Protection Agency's Arkansas 319(h) Program. **Speir listed as sole PI.** Total amount to Speir: **\$123,573.**
2. *Effects of whole reservoir draining on nitrogen and phosphorus cycling in Lake Conway, Arkansas.* Submitted to the USGS 104(b) Program. **Speir listed as sole PI.** Total amount to Speir: **\$66,031.**
3. *Quantifying spatial and temporal variability in urban water quality in a rapidly urbanizing region.* Submitted to the USGS 104(b) Program. C. Anscombe (Speir Lab Master's Student) listed as lead PI, **Speir listed as Co-PI.** Total amount to Speir: **\$20,000.**
4. *AI-Harvest: Harnessing AI for climate-resilient agriculture in vulnerable communities.* Submitted to the NSF EPSCoR Track II Program. L. Peng listed as lead PI, **Speir listed as Co-PI.** Total amount requested: \$2,500,000. Total to Speir: **\$350,000.**

Unfunded Proposals (Lead PI = 2 grants; Co-PI = 4 grants)

1. *GreenN-Land-Coast: Future nitrogen export from land to coast in Greenland.* Submitted to The Carlsberg Foundation in November 2022. T. Riis listed as lead PI, **Speir listed as Co-PI.** Total amount requested: \$1,539,924.68. Amount to Speir: **\$24,000.**
2. *Utilizing the Arkansas Discovery Farm Program to Increase Adoption of Climate-Smart Agriculture and Forestry.* Submitted to the USDA Agriculture and Food Research Initiative (AFRI) Program in September 2022. M. Daniels listed as lead PI, **Speir listed as Co-PI.** Total amount requested: \$1,499,987. Amount to Speir: **\$111,726.**

3. *Gleaning process from pattern: Characterizing hydrologic sourcing to inform mechanisms driving concentration-discharge (C-Q) patterns*. Submitted to the National Science Foundation Hydrologic Sciences Program in June 2022. A.J. Shogren listed as lead PI, **Speir listed as Co-PI**. Total amount requested: \$471,582. Amount to Speir: **\$142,349**.
4. *PermaNOC: Impacts of permafrost thaw on nitrogen and organic carbon dynamics in high-Arctic Streams*. Submitted to the EU INTERACT Transnational Access Program in November 2022. **Speir listed as lead PI**. Total amount requested: \$30,605. Amount to Speir: **\$12,748**.
5. *Stacking the deck for conservation: Layering cover crops and the two-stage ditch to maximize soil health, water quality, and biodiversity*. Submitted to the US NRCS Conservation Innovation Grant (CIG) On-Farm Trials Program in October 2022. **Speir listed as lead PI**. Total amount requested: \$2,135,511. Amount to Speir: **\$1,423,353**.
6. *Quantifying Ecosystem losses across dimensions of Space and Time (QuEST)*. Submitted to NSF Macrosystems Biology Program in November 2022. A. Wymore listed as lead PI, **Speir listed as Co-PI**. Total amount requested: \$2,002,905. Amount to Speir: **\$323,406**.
7. *FARM: Future Agroecosystem Resilience Management to preserve water quality across scales and sustain agricultural production under climate change*. Submitted to the USDA Sustainable Agriculture Systems Program in July 2023. **Speir listed as PI**. Total amount requested: \$9,993,577. Amount to Speir: **\$2,706,130**.

### **Oral Presentations:**

1. **S.L. Speir**, M.M. Chumchal, R. Drenner, W.G. Cocke, M. Lewis, and H.M. Whitt. Use of methyl mercury as a tracer of aquatic carbon flux to terrestrial consumers. Texas Academy of Science 117<sup>th</sup> Annual Meeting. March 2014.
2. **S.L. Speir**. Methyl mercury in emergent aquatic insects and terrestrial spiders reveals linkages between aquatic and terrestrial ecosystems. TCU Senior Honors Thesis Symposium. April 2014.
3. **S.L. Speir**, M.M. Chumchal, R. Drenner, W.G. Cocke, M. Lewis, and H.M. Whitt. Methyl mercury in emergent aquatic insects and terrestrial spiders reveals linkages between aquatic and terrestrial ecosystems. Joint Aquatic Sciences Meeting. May 2014.
4. **S.L. Speir**, J.M. Taylor, J.T. Scott. Seasonal patterns in nitrogen fluxes as a function of nitrate availability in vegetated agricultural ditch sediments. Society for Freshwater Science Annual Meeting. May 2016.
5. J.M. Taylor, **S.L. Speir**, M.M. Moore, J.T. Scott. Enhancing ditch denitrification with rice cutgrass: experimental evidence for a simple nitrate runoff mitigation tool. Mississippi Water Resources Conference. April 2017.
6. **S.L. Speir**, J.L. Tank, T.V. Royer, U.H. Mahl, M.T. Trentman, B.R. Hanrahan, K. Prior, S.F. Christopher. Continuous nitrate data provides a unique insight into nitrate export dynamics during storms in two agricultural watersheds. Society for Freshwater Science Annual Meeting. June 2017.

7. K. Prior, T.V. Royer, J.L. Tank, **S.L. Speir**, M.T. Trentman, B.R. Hanrahan, S.F. Christopher, U.H. Mahl. In-stream carbon cycle impacts from a watershed-scale implementation of winter cover crops: DOC and greenhouse gas dynamics. June 2017.
8. **S.L. Speir**, J.L. Tank, T.V. Royer, U.H. Mahl, M.T. Trentman, B.R. Hanrahan, K. Prior, S.F. Christopher. Real-time monitoring provides insight into nitrate-N export during storms in two agricultural watersheds. Universities Council on Water Resources Annual Meeting. June 2017.
9. M.T. Trentman, J.L. Tank, S.F. Christopher, B.R. Hanrahan, U.H. Mahl, K. Prior, **S.L. Speir**. Comparing the effectiveness of increased winter land cover on nutrient export across two Indiana agricultural watersheds. Universities Council on Water Resources Annual Meeting. June 2017.
10. B.R. Hanrahan, J.L. Tank, S.F. Christopher, M.T. Trentman, U.H. Mahl, **S.L. Speir**, K. Prior, T.V. Royer. Quantifying changes in nutrient export from an agricultural watershed following the planting of winter cover crops. Universities Council on Water Resources Annual Meeting. June 2017.
11. U.H. Mahl, S.F. Christopher, J.L. Tank, B.R. Hanrahan, M.T. Trentman, K. Prior, **S.L. Speir**, T.V. Royer. Linking soil health to improved water quality via the planting of cover crops in two Indiana watersheds. Universities Council on Water Resources Annual Meeting. June 2017.
12. K. Prior, T.V. Royer, J.L. Tank, S.F. Christopher, B.R. Hanrahan, U.H. Mahl, **S.L. Speir**, M.T. Trentman. Response in dissolved organic carbon dynamics and greenhouse gas emissions to watershed-scale implementation of winter cover crops. Universities Council on Water Resources Annual Meeting. June 2017.
13. **S.L. Speir**, J.L. Tank, A.J. Shogren, M.M. Dee, M.T. Trentman. The impact of substrate size and other drivers on nutrient uptake across a five-month biofilm colonization sequence in experimental streams at ND-LEEF. Society for Freshwater Science Annual Meeting. May 2018.
14. A.J. Shogren, J.L. Tank, M.M. Dee, **S.L. Speir**, E.J. Rosi, S.P. Egan, D. Bolster. Biofilm Accumulation mediates the transport of genetically-engineered protein (*Cry1AB*) in experimental streams. Society for Freshwater Science Annual Meeting. May 2018.
15. J.L. Tank, B.R. Hanrahan, U.H. Mahl, **S.L. Speir**, M.T. Trentman, L.R. Sethna, T.V. Royer. The influence of elevated flows on nitrate and phosphorus export from two agricultural watersheds. Society for Freshwater Science Annual Meeting. May 2018.
16. M.M. Dee, J.L. Tank, A.J. Shogren, M.T. Trentman, **S.L. Speir**. Using experimental streams to understand the roles of biofilm colonization and disturbance in estimating reaeration using argon gas as a direct tracer at ND-LEEF. Society for Freshwater Science Annual Meeting. May 2018.
17. N. Ehsani, J.L. Tank, A.F. Hamlet, T.V. Royer, S.F. Christopher, A. Sharma, K. Byun, M.T. Trentman, **S.L. Speir**, L.R. Sethna, C.J. Talbot, U.H. Mahl. Hydrologic and biogeophysical parameter estimation for simulating watershed-scale conservation to



- reduce nutrient losses to surface waters using SWAT. American Geophysical Union Fall Meeting. December 2018.
18. **S.L. Speir**, U.H. Mahl, J.L. Tank. Quantifying the recovery of denitrification following restoration-related construction in an agricultural watershed. Society for Freshwater Science Annual Meeting. May 2019.
  19. N. Ehsani, J.L. Tank, A.F. Hamlet, T.V. Royer, A. Sharma, U.H. Mahl, M.T. Trentman, **S.L. Speir**, K. Byun, and S.F. Christopher. SWAT parameters for modeling watershed-scale conservation to reduce nutrient loss to surface waters. International Association for Great Lakes Research Meeting. June 2019.
  20. **S.L. Speir**, U.H. Mahl, J.L. Tank. Quantifying the recovery of denitrification following restoration-related construction in an agricultural watershed. Indiana Water Resources Association Meeting. June 2019.
  21. T. Thalhuber, M.M. Chumchal, R.W. Drenner, C. Rodriguez-Ortega, J.H. Kennedy, **S.L. Speir**, W.G. Cocks, M.E. Lewis, H.J. Whitt. Mercury contamination and diet of nestling Red-winged Blackbirds. International Conference on Mercury as a Global Pollutant. September 2019.
  22. N. Ehsani, J.L. Tank, A.F. Hamlet, T.V. Royer, U.H. Mahl, M.T. Trentman, **S.L. Speir**, K. Byun. Analyzing the effects of cover crops and climate change on nutrient runoff in Midwestern agricultural watersheds. American Geophysical Union Fall Meeting. December 2019.
  23. **S.L. Speir\***, J.L. Tank, U.H. Mahl. Quantifying denitrification following floodplain restoration via the two-stage ditch. International Association of Great Lakes Research Annual Meeting. June 2020.
  24. L.R. Sethna\*, T.V. Royer, J.L. Tank, **S.L. Speir**, M.T. Trentman, U.H. Mahl. Winter cover crops may reduce harmful algal bloom frequency and intensity in agricultural watersheds by altering N:P:Si ratios. International Association of Great Lakes Research Annual Meeting. June 2020.
  25. A.L. Grose<sup>\*#+</sup>, **S.L. Speir**, J.L. Tank, A.N. Thellman, M.M. Dee. Differences in groundwater contribution to streamflow versus watershed  $\text{NO}_3^-$ -N export reveal importance of scale in evaluating agricultural conservation practices. American Geophysical Union, Annual Fall Meeting, December 2020.
  26. **S.L. Speir\***, J.L. Tank, M.T. Trentman, U.H. Mahl, L.R. Sethna, T.V. Royer. Winter cover crops reduce nutrient losses from fields to waterways in two agricultural watersheds. International Association of Great Lakes Research Annual Meeting. June 2021.
  27. **S.L. Speir\***, J.L. Tank, J.M. Taylor, A.L. Grose. Increased temperature and carbon availability enhances nitrous oxide production due to incomplete denitrification in river sediments. Society for Freshwater Science Annual Meeting. May 2021.
  28. L.R. Sethna\*, T.V. Royer, J.L. Tank, **S.L. Speir**, U.H. Mahl, M.T. Trentman. Does changing land cover alter N:P:Si ratios and risk for cyanobacterial blooms in streams draining intensive agriculture? Society for Freshwater Science Annual Meeting. May 2021.

29. T.V. Royer\*, J.L. Tank, L.R. Sethna, **S.L. Speir**, U.H. Mahl, M.T. Trentman. Effect of winter vegetative cover on dissolved organic carbon (DOC) input to streams draining intensively farmed watersheds. Society for Freshwater Science Annual Meeting. May 2021.
30. J.L. Tank\*, **S.L. Speir**, M.T. Trentman, U.H. Mahl, L.R. Sethna, T.V. Royer. Winter cover crops reduce nutrient losses from fields to waterways in two agricultural watersheds Society for Freshwater Science Annual Meeting. May 2021.
31. A.E.S. Vincent\*<sup>#</sup>, J.L. Tank, **S.L. Speir**, U.H. Mahl, E.D. Snyder, A.N. Pruitt. Quantifying the role of substrate and biofilm colonization in controlling nitrification rates using experimental streams. Society for Freshwater Science Annual Meeting. May 2021.
32. A.N. Pruitt\*<sup>#</sup>, J.L. Tank, **S.L. Speir**, U.H. Mahl, A.E.S. Vincent, T.V. Royer. Land cover change reduces storm-driven sediment export in agricultural streams. Society for Freshwater Science Annual Meeting. May 2021.
33. E.D. Snyder\*<sup>#</sup>, J.L. Tank, K. Bibby, A.W. Bivins, P.F.P. Brandão Dias, A.E.S. Vincent, **S.L. Speir**, A.N. Pruitt, G.A. Lamberti. Exploring the role of biofilm colonization on the transport and fate of environmental DNA (eDNA). Society for Freshwater Science Annual Meeting. May 2021.
34. A.E.S. Vincent\*<sup>#</sup>, J.L. Tank, **S.L. Speir**, M.T. Trentman, U.H. Mahl, A.N. Pruitt<sup>#</sup>, T.V. Royer, S.S. Roley. Influence of storms on ecosystem metabolism in two agricultural watersheds. Fourth International Workshop on High Temporal Resolution Water Quality Monitoring and Analysis. June 2021.
35. A.N. Pruitt\*<sup>#</sup>, J.L. Tank, **S.L. Speir**, U.H. Mahl, A.E.S. Vincent, T.V. Royer. Winter cover crops reduce stream sediment export during storms. Fourth International Workshop on High Temporal Resolution Water Quality Monitoring and Analysis. June 2021.
36. **S.L. Speir**\*, J.L. Tank, M. Bieroza, U.H. Mahl, T.V. Royer. Storm size and hydrologic modification influence nitrate mobilization and transport in agricultural watersheds. Fourth International Workshop on High Temporal Resolution Water Quality Monitoring and Analysis. June 2021.
37. **S.L. Speir**\*, J.L. Tank, M. Bieroza, U.H. Mahl, T.V. Royer. Storm size and hydrologic modification influence nitrate mobilization and transport in agricultural watersheds. ASLO 2021 Aquatic Sciences Virtual Meeting. June 2021.
38. E.C. Seybold, M.A. Wolford<sup>#</sup>, C. Brown<sup>#</sup>, A.J. Burgin, S. Flynn, S.E. Godsey, R.L. Hale, C.N. Jones, D.M. Peterson<sup>#</sup>, C.R. Smith<sup>#</sup>, **S.L. Speir**, C. Wheeler, J. Wilhelm, S.C. Zipper. The effects of flow intermittency and groundwater-surface water exchange on stream biogeochemistry in a non-perennial prairie stream. American Geophysical Union, Annual Fall Meeting, December 2021.
39. **S.L. Speir**, C.L. Atkinson, M.A. Wolford<sup>#</sup>, D.C. Allen, J.P. Benstead, R.L. Hale, C.N. Jones, D.M. Peterson<sup>#</sup>, E.C. Seybold, A.J. Shogren, S.G. Thomas, A.J. Burgin. Flow and behold: Non-perennial flow regimes impact sediment export across the continental USA. Joint Aquatic Sciences Meeting, May 2022.

40. M.A. Wolford<sup>#</sup>, A.J. Shogren, **S.L. Speir**, D.M. Peterson<sup>#</sup>, C.L. Atkinson, J.P. Benstead, C.N. Jones. Hydrologic Controls on Dissolved Organic Matter Partitioning in Intermittent Southeastern US Streams. Joint Aquatic Sciences Meeting, May 2022.
41. E.C. Seybold, C.L. Atkinson, J.P. Benstead, C.L. Brown, S. Flynn, R.L. Hale, C.N. Jones, **S.L. Speir**, L.J. Swenson, C. Wheeler, J. Wilhelm, M.A. Wolford, S.C. Zipper, A.J. Burgin. Changes in groundwater contributions influence streamwater chemistry during dry-down of a non-perennial prairie stream network. Joint Aquatic Sciences Meeting, May 2022.
42. Burgin, A.J., K.A. Aho, D.C. Allen, C.L. Atkinson, J.P. Benstead, J. Brooks-Keiffer, S.E. Godsey, R.L. Hale, C.R. Jackson, J.T. Johnson, C.N. Jones, K.A. Kuehn, D. Lemke, K.A. Lohse, J. Meisel, E.C. Seybold, A.J. Shogren, Y. You, L.H. Zeglin, S.C. Zipper, S.C. Cook, B.L. Richards, **S.L. Speir**, S.G. Thomas, A. Belskis, E. Bilbrey, C.T. Bond, C.L. Brown, H. Czech, S.M Flynn, A.L. Kemajou Tchamba, T. Kerner, R.S. Lanfear, L.J. Swenson, B. Nave, D.M. Peterson, C.R. Smith, C.T. Wheeler, J.F. Wilhelm, M.A. Wolford. Building the AIMS Network: Exploring the Aquatic intermittency effects of Microbiomes in Streams. Joint Aquatic Sciences Meeting, May 2022.
43. A.E.S. Vincent, J.L. Tank, A.N. Pruitt, **S.L. Speir**, M.T. Trentman, U.H. Mahl, T.V. Royer. Mismatches between ammonium and nitrate losses from fields and stream export in two agricultural watersheds. Joint Aquatic Sciences Meeting, May 2022.
44. C.N. Jones, **S.L. Speir**, A.J. Shogren, C.L. Atkinson. How does uncertainty in streamflow measurements impact estimates of downstream solute export? Joint Aquatic Sciences Meeting, May 2022.
45. J.L. Tank, **S.L. Speir**, A. Pastor, T. Riis. Long-term changes in summer nitrogen export from the high Arctic Zackenberg River, NE Greenland. Joint Aquatic Sciences Meeting, May 2022.
46. **S.L. Speir**<sup>^\*</sup>, A.L. Robison, K.S. Aho, B.L. Bertolet, A. Ghosh, L. Heffernan, R. LaBrie, R.L. Maher, N.E. Ray, P.C.J. Reis. Biogeochemical controls on bacterial communities and gene diversity across US streams. DSOS Virtual Summit: Incorporating Data Science and Open Science in Aquatic Research, July 2022.
47. K. Zarek<sup>#</sup>, C.N. Jones, D.M. Peterson<sup>#</sup>, **S.L. Speir**, C.L. Atkinson, A.J. Burgin, J.P. Benstead. Spatio-temporal variation of nitrogen biogeochemistry in a forested intermittent watershed. Alabama Water Resources Conference, September 2022.
48. D.M. Peterson<sup>#</sup>, C.N. Jones, M.A. Wolford<sup>#</sup>, **S.L. Speir**, A.J. Shogren. Investigating physical drivers of stream intermittency in Alabama. Alabama Water Resources Conference, September 2022.
49. **S.L. Speir**, J.L. Tank, Z. Silver, U.H. Mahl, A.F. Hamlet, N. Ehsani, T.V. Royer. Reductions in nitrate and soluble reactive phosphorus loss with cover crops in two midwestern agricultural watersheds using SWAT and field validation. AGU Fall Meeting, December 2022.

50. D.M. Peterson<sup>#</sup>, C.N. Jones, **S.L. Speir**, K.R. Zarek, M.A. Wolford, A.J. Shogren. Physical drivers of streamflow and drying across a physiographic gradient in the Southeastern US. Mississippi Water Resources Conference, March 2023.
51. A.N. Pruitt<sup>#</sup>, J.L. Tank, **S.L. Speir**, A.J. Reisinger. Environmental and seasonal controls on denitrification vary between an agricultural river and its tributary stream. Society for Freshwater Science Annual Meeting, June 2023.
52. K.R. Zarek<sup>#</sup>, C.N. Jones, D.M. Peterson<sup>#</sup>, A.J. Shogren, **S.L. Speir**. Exploring hydrologic connectivity and nitrogen biogeochemistry in forested headwaters. Alabama Water Resources Conference, September 2023.  
*\*\*won 2<sup>nd</sup> place in student presentation competition.*
53. D.M. Peterson<sup>#</sup>, C.N. Jones, K.R. Zarek<sup>#</sup>, A.J. Shogren, **S.L. Speir**. Physical drivers of streamflow and drying vary across a physiographic gradient in the Southeastern US. Alabama Water Resources Conference, September 2023.

<sup>#</sup> denotes undergraduate/graduate student mentee

\*denotes virtual presentation

<sup>+</sup> won 2020 AGU Outstanding Student Presentation Award

<sup>^</sup> denotes plenary speaker

### **Invited Seminars, Plenary Talks, & Lectures:**

1. Determination of the source of methyl mercury (MeHg) to shoreline spiders using <sup>15</sup>N stable isotopes. TCU “Introduction to Biological Research” Course. November 2013.
2. Determination of the source of methyl mercury (MeHg) to shoreline spiders using <sup>15</sup>N stable isotopes. TCU Alumni Association. April 2014.\*
3. Mercury contamination on a global scale. University of Arkansas Stream Ecology Course. December 2014
4. Seasonal patterns in dissolved gas and nutrient fluxes as a function of nitrate availability in vegetated agricultural ditch sediments. University of Arkansas Crop, Soil, and Environmental Science Departmental Seminar. March 2016.
5. From mercury to nitrogen: Swimming across the periodic table. University of Notre Dame Biological Sciences Graduate Student Seminar. October 2016.
6. Real-time nitrate data provides insight into management of nitrate-N export during storms in agricultural watersheds. University of Notre Dame Biological Sciences Graduate Student Seminar. November 2017.
7. Decomposition and coarse particulate organic matter. University of Notre Dame Stream Ecology Course. September 2018.
8. Hydrology and human impacts on freshwater ecosystems. Indiana Master Naturalist Course. September 2018.\*
9. The impact of substrate size and other drivers on nutrient uptake across a five-month biofilm colonization sequence in experimental streams at ND-LEEF. University of Notre Dame Biological Sciences Graduate Student Seminar. November 2018.

9. Decomposition and nutrient cycling. University of Notre Dame General Ecology Course. April 2019.
10. Two-stage ditch, cover crops, and water quality. Northwest Indiana Conservation Happenings Meeting. June 2019.<sup>+</sup>
11. Using stacked conservation practices to improve soil health and water quality in two Indiana watersheds. University of Notre Dame Sustainability Principles Course. November 2019.
12. Quantifying denitrification following two-stage ditch construction in a Midwestern agricultural watershed. University of Notre Dame Biological Sciences Graduate Student Seminar. November 2019.
13. Characterizing Storm Nitrate Export in Agricultural Watersheds using High-Frequency Sensor Data. University of Notre Dame Biological Sciences Graduate Student Seminar. October 2020.
14. Isotope Tracers and Food Webs. University of Notre Dame Stream Ecology Course. November 2020.
15. Stacking the deck: Layered conservation to improve water quality. Arkansas Soil and Water Education Conference. January 2023.<sup>+</sup>
16. Taking edge-of-field monitoring to the next level. Arkansas Discovery Farm Conference. February 2023.<sup>+</sup>
17. Stacking the deck: Layered conservation to improve water quality. USDA Agricultural Research Service National Sedimentation Lab Seminar Series. March 2023.\*
18. Stacking the deck: Layered conservation to improve water quality. Army Corps of Engineers Seminar Series. April 2023.\*
19. Taking edge-of-field monitoring to the next level. Arkansas Water Resources Conference. July 2023.<sup>+</sup>
20. Climate impacts on water quality: A perspective from agricultural, intermittent, and Arctic Streams. University of Arkansas Department of Geosciences Colloquium. September 2023.\*
21. Climate impacts on water quality: A perspective from agricultural, intermittent, and Arctic Streams. University of Arkansas Department of Biological Sciences Seminar. October 2023.\*

\* denotes invited lecturer/seminar speaker

<sup>+</sup> denotes plenary speaker

### **Poster Presentations:**

1. **S.L. Speir**, J.M. Taylor, and J.T. Scott. Quantifying denitrification rates as a function of nitrate availability in vegetated agricultural ditches. Society for Freshwater Science Annual Meeting. May 2015.

2. **S.L. Speir**, J.L. Tank, T.V. Royer, U.H. Mahl, M.T. Trentman, B.R. Hanrahan, K. Prior, S.F. Christopher. Real-time nitrate data provides insight into management of nitrate-N export during storms in agricultural watersheds. WaterSmart Innovations Conference. October 2017.
3. M.T. Trentman, J.L. Tank, T.V. Royer, B.R. Hanrahan, U.H. Mahl, K. Prior, **S.L. Speir**. The impact of cover crops on the export of phosphorus from tile drains. WaterSmart Innovations Conference. October 2017.
4. L.R. Sethna, T.V. Royer, M.T. Trentman, **S.L. Speir**, J.L. Tank. Responses of silica stoichiometry to hydrologic and vegetation changes. Society for Freshwater Science Annual Meeting. May 2018.
5. **S.L. Speir**, J.L. Tank, U.H. Mahl. Quantifying the recovery of nitrogen removal capacity via denitrification following stream dredging and floodplain construction in an agricultural watershed. University of Notre Dame College of Science Joint Annual Meeting. December 2018.
6. N. Ehsani, J.L. Tank, A.F. Hamlet, T.V. Royer, S.F. Christopher, A. Sharma, K. Byun, M.T. Trentman, **S.L. Speir**, L.R. Sethna, C.J. Talbot, U.H. Mahl. Hydrologic and biogeophysical parameter estimation for simulating watershed-scale conservation to reduce nutrient losses to surface water using SWAT. University of Notre Dame College of Science Joint Annual Meeting. December 2018.
7. C.J. Talbot, J.L. Tank, M.T. Trentman, **S.L. Speir**, U.H. Mahl. Using a replicated watershed design to evaluate the role of cover crops in reducing nutrient pollution. University of Notre Dame College of Science Joint Annual Meeting. December 2018.
8. N.T. Gorman<sup>#</sup>, **S.L. Speir**, U.H. Mahl, J.L. Tank. Comparing methods for quantifying denitrification rates in stream sediments and floodplain soils. University of Notre Dame College of Science Joint Annual Meeting. May 2019.
9. **S.L. Speir**, J.L. Tank, M. Bierzoza, U.H. Mahl, T.V. Royer. Controls on nitrate export during storms in two contrasting agricultural watersheds. University of Notre Dame College of Science Joint Annual Meeting. December 2019.
10. **S.L. Speir\***, J.L. Tank, M. Bierzoza, U.H. Mahl, T.V. Royer. Hysteresis patterns suggest increased vegetative cover mediates NO<sub>3</sub><sup>-</sup>-N export in two agricultural watersheds. Society for Freshwater Science, Summer of Science Meeting. June 2020.
11. A.L. Grose<sup>#\*</sup>, **S.L. Speir**, J.L. Tank. Differences in groundwater contributions to streamflow versus watershed NO<sub>3</sub><sup>-</sup>-N export reveal the importance of scale in evaluating agricultural conservation practices. Society for Freshwater Science, Summer of Science Meeting. June 2020.
12. A.F. Hamlet\*, N. Ehsani, Z. Silver, U.H. Mahl, K. Byun, **S.L. Speir**, M.T. Trentman, J.L. Tank, T.V. Royer. Projected cover crop performance in the Midwestern US improves response to climate change. American Geophysical Union, Annual Fall Meeting, December 2020.

13. **S.L. Speir\***, J.L. Tank, M. Bieroza, U.H. Mahl, T.V. Royer. Hysteresis patterns during storms suggest that vegetative cover mediates nitrate export in two agricultural watersheds. American Geophysical Union, Annual Fall Meeting, December 2020.
14. J.A. Fries<sup>#\*</sup>, **S.L. Speir**, J.L. Tank, A.N. Pruitt, U.H. Mahl, T.V. Royer. High-frequency sensor data reveals sediment hysteresis during storms in two agricultural watersheds. Society for Freshwater Science Annual Meeting. May 2021.
15. L.D. Kohler<sup># +</sup>, **S.L. Speir**, M.A. Wolford, C.L. Atkinson. Understanding the impacts of silvicultural activities on downstream sediment export and ecosystem function via experimental sediment additions. University of Alabama Undergraduate Research and Creative Activity Conference, April 2022.
16. L.D. Kohler<sup>#</sup>, **S.L. Speir**, M.A. Wolford, C.L. Atkinson. Understanding the impacts of silvicultural activities on downstream sediment export and ecosystem function via experimental sediment additions. Mississippi Water Resources Conference, April 2022.
17. C.L. Brown<sup>#</sup>, C. Wheeler, **S.L. Speir**, D.C. Allen, J.P. Benstead, A.J. Burgin, R.L. Hale, E.C. Seybold. Duration of drying controls the magnitude and recovery of metabolism in U.S. intermittent streams. Joint Aquatic Sciences Meeting, May 2022.
18. E.E. Burke<sup>#</sup>, A.J. Shogren, **S.L. Speir**, C. Wheeler, J.F. Wilhelm, S.C. Zipper, A.J. Burgin. Spatial and temporal variation in suspended solids during the drydown of a prairie watershed. Joint Aquatic Sciences Meeting, May 2022.
19. M.A. Wolford<sup>#</sup>, A.J. Shogren, **S.L. Speir**, D.M. Peterson<sup>#</sup>, C.L. Atkinson. Hydrologic controls on organic matter partitioning in headwater streams across Alabama. Alabama Water Resources Conference, September 2022.
20. A.E.S. Vincent<sup>#</sup>, J.L. Tank, A.N. Pruitt<sup>#</sup>, **S.L. Speir**, M.T. Trentman, U.H. Mahl, T.V. Royer. Exploring linkages between ammonium and nitrate losses from fields, nutrient export, and stream metabolism in two agricultural watersheds. AGU Fall Meeting, December 2022.
21. A.N. Pruitt<sup>#</sup>, J.L. Tank, **S.L. Speir**, U.H. Mahl, J.A. Fries, A.E.S. Vincent, T.V. Royer. Changing land cover via the planting of cover crops reduces storm-drive sediment export in agricultural streams. AGU Fall Meeting, December 2022.
22. E.C. Seybold, A.J. Burgin, C.L. Brown<sup>#</sup>, **S.L. Speir**, C.T. Wheeler, S.C. Zipper. Linking oxygen regimes to flow regimes in non-perennial streams. AGU Fall Meeting, December 2022.
23. W. Larsen, H. Fazekas, D.W. Kincaid, W.H. McDowell, D. Murray, A.J. Shogren, **S.L. Speir**, K. Underwood, A. Webster, A.S. Wymore. Revisiting the power-law function as a model for concentration-discharge relationships. AGU Fall Meeting, December 2022.
24. J.L. Major<sup># +</sup>, **S.L. Speir**, B.E. Haggard. Comparing spatiotemporal phosphorus dynamics in two agricultural watersheds with different levels of poultry and livestock production. Arkansas Discovery Farm Conference. February 2023.

25. D.M. Peterson<sup>#</sup>, C.N. Jones, **S.L. Speir**, K.R. Zarek, M.A. Wolford, A.J. Shogren. Physical drivers of streamflow and drying across a physiographic gradient in the Southeastern US. Alabama Water Institute Symposium, April 2023.
26. K.R. Zarek<sup>#</sup>, C.N. Jones, D.M. Peterson, M.A. Wolford, C.L. Atkinson, A.J. Shogren, **S.L. Speir**. The spatio-temporal variation of denitrification in non-perennial forested watershed. Alabama Water Institute Symposium, April 2023.
27. J.L. Major<sup>#</sup>, **S.L. Speir**, B.E. Haggard. Comparing spatiotemporal phosphorus dynamics in two agricultural watersheds with different levels of poultry and livestock production. University of Arkansas National Undergraduate Research Week Poster Competition, April 2023.
28. J.E. Todd<sup>#</sup>, **S.L. Speir**. Influence of seasonal temperature and flow variation on phosphorus uptake in the Upper White River, Arkansas. University of Arkansas National Undergraduate Research Week Poster Competition, April 2023.
29. L.A. Stults<sup>#</sup>, **S.L. Speir**, M. Daniels. Conservation effects on edge-of-field sediment and phosphorus loss on Arkansas Discovery Farms. University of Arkansas National Undergraduate Research Week Poster Competition, April 2023.
30. D. Scott<sup>#</sup>, **S.L. Speir**, L.S. Wood. Stream Restoration Effectiveness in Mullins Creek in Fayetteville, Arkansas. University of Arkansas National Undergraduate Research Week Poster Competition, April 2023.
31. I. Tamayo<sup>#</sup>, **S.L. Speir**. Changing delivery of streamflow to Beaver Lake Reservoir, Northwest Arkansas. University of Arkansas National Undergraduate Research Week Poster Competition, April 2023.
32. **S.L. Speir**, C.L. Atkinson, M.A. Wolford, J.S. Ackerman, A.J. Shogren, D.M. Peterson, C.N. Jones. Spatial variation in sediment export is linked to watershed attributes in non-perennial streams in Alabama, USA. Gordon Research Conference in Catchment Science, June 2023.
33. D.M. Peterson<sup>#</sup>, C.N. Jones, **S.L. Speir**, K.R. Zarek, M.A. Wolford, A.J. Shogren. Physical drivers of streamflow and drying across a physiographic gradient in the Southeastern US. Gordon Research Conference in Catchment Science, June 2023.
34. M.A. Wolford<sup>#</sup>, A.J. Shogren, **S.L. Speir**, C.L. Atkinson, E.R. Hotchkiss, K.R. Zarek. Chasing carbon: Dissolved and particulate organic matter composition, transformation, and transport in a headwater stream network in Alabama, U.S. Gordon Research Conference in Catchment Science, June 2023.
35. K.R. Zarek<sup>#</sup>, C.N. Jones, D.M. Peterson, M.A. Wolford, C.L. Atkinson, A.J. Shogren, **S.L. Speir**. The removal and export of nitrogen in southeastern U.S. intermittent streams. Gordon Research Conference in Catchment Science, June 2023.
36. L.A. Stults<sup>#</sup>, **S.L. Speir**, M. Daniels. Conservation effects on edge-of-field sediment and phosphorus loss on Arkansas Discovery Farms. Arkansas Water Resources Conference, July 2023.



37. D. Scott<sup>#</sup>, **S.L. Speir**, L.S. Wood. Stream Restoration Effectiveness in Mullins Creek in Fayetteville, Arkansas. Arkansas Water Resources Conference, July 2023.
38. I. Tamayo<sup>#</sup>, **S.L. Speir**. Changing delivery of streamflow to Beaver Lake Reservoir, Northwest Arkansas. Arkansas Water Resources Conference, July 2023.
39. B. Beck<sup>#</sup>, **S.L. Speir**, C. Meara<sup>#</sup>. Quantifying freshwater salinization impacts on nitrate removal via denitrification in urban streams. Arkansas Water Resources Conference, July 2023.
40. A.S. Wymore, **S.L. Speir**, L.A. Rose, J.R. Blaszczyk, H.M. Fazekas, D.W. Kincaid, M.A. Wolford, A.J. Shogren, A.J. Webster. Concentration-discharge relationships across temporal scales. AGU Fall Meeting, December 2023.
41. D.M. Peterson<sup>#</sup>, C.N. Jones, K.R. Zarek, **S.L. Speir**, A.J. Shogren, S. Godsey. Physical drivers of streamflow and drying across a physiographic gradient in the Southeastern US. AGU Fall Meeting, December 2023.

<sup>#</sup>denotes graduate/undergraduate mentee

\*denotes virtual poster presentation

<sup>+</sup>poster award winner

#### **Special Sessions for Conference Proceedings:**

1. **S.L. Speir**, A. Hounshell, M. Bieroza, J. Hosen, E. Hotchkiss, J.L. Tank. Exploring freshwater ecosystems under a changing climate via storm-driven nutrient, carbon, and sediment transport and biogeochemical cycling. Society for Freshwater Science Annual Meeting. May 2021.
2. J. Singley, **S.L. Speir**, L. Gomez Gener, T. Silverthorn. Flooded with ideas on dry rivers: Hydro-biogeochemistry of intermittent freshwater systems. Joint Aquatic Sciences Meeting. May 2022.
3. A.N. Price, **S.L. Speir**, E.C. Seybold, S.C. Zipper. Global Impact of Non-perennial Waterways: Integrating Hydrological, Geochemical, Microbiological, and Social Perspectives. American Geophysical Union Fall Meeting. December 2022.

#### **Graduate Student Advising – in reverse chronological order:**

2. Kathleen Cutting. University of Arkansas. Crop, Soil, Environmental Sciences. *Controls on nutrient and sediment export in a non-perennial agricultural stream*. **Master's Degree**, August 2023-present. Expected graduation: Spring 2025.
1. Caroline Anscombe. University of Arkansas. Crop, Soil, Environmental Sciences. *Effect of urbanization on stream nutrient loads and decomposition*. **Master's Degree**, August 2023-present. Expected graduation: Spring 2025.

#### **Graduate Committee Service – in reverse chronological order:**

4. Dana Villareal. University of Arkansas. Environmental Dynamics. **PhD Degree**, Fall 2023-present. Committee Chair: Dr. Becca Muenich (BAEG). Expected graduation: Spring 2026.

3. Brandy Everett. University of Arkansas. Environmental Dynamics. **Master's Degree**, January 2023-present. Committee Chair: Dr. Brian Haggard (BAEG). Expected graduation: Fall 2024.
2. Emily Carter. University of Arkansas. Biological Sciences. **Master's Degree**, January 2023-present. Committee Chair: Dr. Michelle Evans-White (BISC). Expected graduation: Fall 2024.
1. Benjamin Walters. University of Arkansas. Geosciences. **Master's Degree**, Fall 2022-present. Committee Chair: Dr. Kevin Befus (GEOS). Expected graduation: Spring 2024.

**Undergraduate Student Advising – in reverse chronological order:**

13. Brody Wilson. University of Arkansas. *Construction impacts on phosphorus and nitrogen loss in an urban stream*. **Honors Thesis**, Fall 2023-present. Expected Graduation: Fall 2025.
12. Brynna Beck. University of Arkansas. *Freshwater salinization impacts on nitrate removal via denitrification*. **Honors Thesis**, Spring 2023-present. Expected graduation: Spring 2025.
11. Jacob Major. University of Arkansas. *Phosphorus dynamics in an agricultural watershed*. **Honors Thesis**, Fall 2022-present. Expected graduation: Fall 2024.
10. Claire Meara. University of Arkansas. *Freshwater salinization impacts on microbial respiration*. **Honors Thesis**, Spring 2023-present. Expected graduation: Fall 2024.
9. Jacqueline Todd. University of Arkansas. *Land use controls on nutrient uptake*. **Independent Project**, Fall 2022-present. Expected graduation: Spring 2024.
8. Lilly Stults. University of Arkansas. *Reductions in edge-of-field sediment loss due to cover crop planting*. **Independent Project**, Spring 2023-present. Graduation: Fall 2023.
7. Ireya Tamayo. University of Arkansas. *Changing streamflow delivery to Beaver Lake Reservoir*. **Independent Project**, Spring 2023-present. Graduation: Fall 2023.
6. Amadeo Scott. University of Arkansas. *Effectiveness of urban restoration on water quality in Mullins Creek*. **Honors Thesis**, Fall 2022-present. Graduation: Fall 2023.
5. Justus King. University of Alabama. *Prevalence of soil pipes along an intermittent stream in Alabama*. **Independent Project**, Summer 2022. Expected Graduation: May 2025.
4. Jacob Ackerman. University of Alabama. *Watershed geomorphology controls sediment export in intermittent streams*. **Independent Project**, Summer 2022. Expected graduation: Spring 2024.
3. Caroline Anscombe. University of Alabama. *Controls on leaf litter decomposition in intermittent streams*. **Independent Project**, Summer 2022. Graduation: May 2023.
2. Lacey Kohler. University of Alabama. *Controls on sediment export in an intermittent stream*. **Independent Project**, Fall 2021-Spring 2022. Graduation: May 2022.
1. Amelia Gross. University of Notre Dame. *Groundwater contributions to an agricultural stream*. **Honors Thesis**, Spring 2018-Spring 2020. Graduation: May 2020.

### **Workshops:**

Oct 2023	Grant Writers' Seminar and Workshop, Phase I
Fall 2023	Graduate Student Mentoring Workshop Series (n= 6 workshops)
July 2023	Revisiting the Freshwater Imperative Workshop
Jan 2023	University of Arkansas 2023 Winter Teaching Symposium
2022-2023	University of Arkansas Division of Agriculture TREAT Program
Fall 2022	University of Arkansas BRIDGE Program
Oct 2021	Ecological Dissertations in the Aquatic Sciences (Eco-DAS) 2021 Symposium
Aug 2021	Data Carpentries Instructor Training
Aug 2021	Data Carpentries Geospatial Workshop
June 2021	SLU High Temporal Resolution Water Quality Monitoring and Analysis
Aug 2020	ND Kaneb Center “Setting the Tone” Workshop for teaching during COVID
July 2020	ND Office of Grants & Fellowships “Personal Statement” Workshop
July 2020	ND Office of Grants & Fellowships “Anatomy of a Grant” Workshop
Nov 2019	Conservation Behavior Change Workshop with Grid Impact
Nov 2019	SMART Stakeholder Communication Workshop with Spitfire Strategies
Mar 2018	ND GLOBES Program Media Science Communication Workshop
Nov 2017	CUAHSI High-Frequency Sensor Workshop

### **Service Activities:**

Spring 2024	Member, Arkansas CSES Department Head Search Committee
Fall 2023	Member, Arkansas Center for Agricultural Data Analytics Search Committee
2023-present	Arkansas Research Representative, SERA-46 Multistate Project
2023-present	Founder, Arkansas Two-Stage Working Group
2023-2023	Member, Arkansas Nutrient Reduction Strategy Innovation Working Group
2022-present	University of Arkansas Department of CSES DEI Committee
2022-present	Society for Freshwater Science Long-Range Planning Committee
2021-present	Society for Freshwater Science Policy Committee
April 2021	Invited Panelist, University of Oklahoma <i>Dive into SciComm</i> Event
2020-2021	Founder, Notre Dame Aquatic Ecology Anti-Racism Reading Group
2020-2021	ND Office of Sustainability Water Working Group Member
2020-2021	Student Representative, Society for Freshwater Science Board of Directors
June 2020	Invited Panelist, Society for Freshwater Science Student SciComm Workshop
2019-2020	Chair, Society for Freshwater Science Student Resources Committee (SRC)
2019-2020	Member, Society for Freshwater Science Diversity & Inclusivity Committee
2019-2020	Co-Organizer, Society for Freshwater Science Meeting Student Workshop
April 2018	Volunteer, Girls Ambitious about Learning Science (GALS)
2017-2019	Member, Society for Freshwater Science Silent Auction Committee
2016-2017	Chair, Society for Freshwater Science SRC Merchandise Committee
2016-2019	Volunteer, ND Environmental Change Initiative’s Annual Science Sunday
2014-2016	Race Director, University of Arkansas CSES Graduate Student Annual 5K

### **Media:**

1. Undergraduate research featured on the cover of and in an article within TCU Magazine:  
*Nine questions that could change the world*, “Spiders as Mercury Contaminators,”

Summer 2015 issue. <https://magazine.tcu.edu/summer-2015/spiders-as-mercury-contaminators/>

2. Invited to showcase dissertation research: South Bend's WNIT "Outdoor Elements" Segment, June 2019. <https://www.wnit.org/outdoorelements/e/june-23rd-2019.html>
3. NRCS Video on the Indiana Watershed Initiative Project: "Advancing Conservation through Partnerships," September 2019. <https://www.youtube.com/watch?v=tcNztQqGIKA>
4. NCR-SARE dissertation research featured: Notre Dame College of Science news titled "Graduate student receives sustainable agriculture grant," December 2019. <https://science.nd.edu/news/graduate-student-receives-sustainable-agriculture-grant/>
5. Indiana Watershed Initiative research featured: Grist article titled "Last-Ditch Effort," January 2020. <https://grist.org/food/how-do-we-fix-americas-fertilizer-problem-look-in-this-ditch/>
6. University of Arkansas Division of Agriculture Agricultural Experiment Station news titled "Arkansas Researcher's Collaborative Method May Reveal Solutions to Water Quality Issues," August 2022. <https://aaes.uada.edu/news/new-faculty-speir/>
7. Arkansas Democrat Gazette article titled "Water research is a collaborative effort," August 2022. <https://www.arkansasonline.com/news/2022/aug/30/water-research-is-collaborative-effort/>
8. Featured in TCU's Horned Frogs in the News. August 2022. <https://www.tcu.edu/news/2022/horned-frogs-in-the-news-aug-17-31.php>
9. University of Arkansas Division of Agriculture Agricultural Experiment Station news titled "Arkansas Researcher's Collaborative Method May Reveal Solutions to Water Quality Issues," August 2022. <https://aaes.uada.edu/news/speir-water-quality-p-runoff/>
10. Featured on the Arkansas Water Resources Center *Water Currents*: "Dr. Shannon Speir begins 104(B) project on collaborative conservation for agricultural watersheds," September 2022. <https://watercurrents.uada.edu/dr-shannon-speir-begins-104b-project-on-collaborative-conservation-for-agricultural-watersheds/>
11. University of Arkansas Division of Agriculture Agricultural Experiment Station news titled "Phosphorus Runoff Studies Show Importance of Stable Banks, Cover Crops," May 2023. <https://aaes.uada.edu/news/speir-water-quality-p-runoff>  
*Also featured in University of Arkansas News, FarmTalk Newspaper, Stuttgart Daily Leader, Newton County Times, Seed Today, Delta Farm Press, Mid-America Farmer Grower, Phys.org, UA Cossatot*
12. University of Arkansas Division of Agriculture Agricultural Experiment Station news titled "Taking a Closer Look at Headwater Streams in Light of Climate Change," September 2023. <https://aaes.uada.edu/news/speir-water-quality/>  
*Also featured in the University of Arkansas News, Batesville Daily Guard, Searcy Daily Citizen, Heber Springs Sun-Times, Newton County Times*

### **Honors & Awards:**

1. University of Notre Dame Notebaert Premier Fellowship
2. Phi Beta Kappa – inducted as a Junior
3. Big XII Dr. Gerald Lage Award – The Big 12 Conference's Highest Academic Honor
4. TCU Greek Woman of the Year 2013

5. TCU John V. Roach Honors College Boller Award Finalist for Outstanding Senior Honors Thesis Presentation
6. TCU Antonio Rivarés Award for Outstanding Achievement in Spanish – awarded to one graduating major student
7. TCU Faculty Choice Award for Excellence in Spanish
8. TCU Clark Society Scholar – Awarded for character, leadership, and sense of service
9. TCU John V. Roach Honors College
10. Texas Academy of Science Annual Meeting Honorable Mention Presentation Award
11. Order of Omega – Greek Leadership Honor Society
12. Academic All-Big 12 Scholar – First Team (2012-2013 & 2013-2014)
13. Mountain West Scholar-Athlete Honor (2011-2012)
14. Mountain West All-Conference Academic Honor (2011-2012)
15. TCU Dean’s Scholarship
16. TCU College of Science & Engineering Dean’s List (8 semesters)
17. Alpha Lambda Delta Honor Society
18. Gamma Sigma Alpha – National Greek Academic Honor Society
19. National Society of Collegiate Scholars

**Journal Reviews (~2 per quarter):** Journal of Environmental Quality, Ecosystems, Journal of Geophysical Research: Biogeosciences, Aquatic Sciences, Hydrological Processes, Water Resources Research, Wetlands, Limnology & Oceanography

**Grant Ad Hoc Reviews & Panel Service:** National Science Foundation

**Society Membership:**

- 2014-present Society for Freshwater Science
- 2020-present American Geophysical Union
- 2020-2022 Association for the Sciences of Limnology and Oceanography

**Analytical Skills:** dissolved gas analysis with Membrane Inlet Mass Spectrometry (MIMS), nutrient analysis using fluorometry and Lachat Autoanalyzer, intact sediment core incubations, acetylene block, SUNA nitrate high-frequency sensors, extensive field work experience, Shimadzu TOC analyzer (DOC analysis), isotope ratio mass spectrometry for <sup>2</sup>H and <sup>18</sup>O

**Professional Skills:** programming in R, science communication, scientific writing and presentation, grant writing and reporting, collaborative research experience, data management