



# Shannon L. Speir, Ph.D.

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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 cycling and 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
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

## Publications ([Google Scholar Page](#)) – listed in reverse chronological order

#Undergraduate Advisee

14. L.R. Sethna, T.V. Royer, **S.L. Speir**, M.T. Trentman, U.H. Mahl, L.P. Hagemeyer; J.L. Tank. Silicon concentrations and stoichiometry in two agricultural watersheds: implications for management and downstream water quality. *Biogeochemistry*.  
<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. Cocke, 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:*

1. **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. *In preparation for Geophysical Research Letters*.
2. A.F. Hamlet, N. Ehsani, J.L. Tank, Z. Silver, K. Byun, U.H. Mahl, **S.L. Speir**, M.T. Trentman, T.V. Royer. Effects of climate and winter cover crops on nutrient loss in agricultural watersheds in the Midwestern U.S. *In review with Journal of Hydrology: Regional Studies*.

*In preparation for submission in mid-2022:*

1. **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 preparation for Journal of Geophysical Research: Biogeosciences*.
2. J.L. Tank, **S.L. Speir**, Z. Silver, U.H. Mahl, A.F. Hamlet, N. Ehsani, T.V. Royer. Effect of cover crops on nitrate and soluble reactive phosphorus loss: a validation of cover crop simulations using the SWAT model. *In preparation for Journal of Environmental Management*.
3. **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 preparation for Applied Soil Biology*.

**Grants (Total Amount Funded = \$54,017.61):**

Nov 2021	Alabama Water Institute Research Funds (\$9,215.44)
May 2020	ND Center for Environmental Science & Technology Fellowship (\$11,646)
Sept 2019	ND Rapid Exposure to Advanced Computational Training (REACT; \$1,148.24)
July 2019	USDA North Central Region SARE Grant (\$13,351)
July 2019	Notre Dame Graduate School Professional Development Research Grant (\$515)
April 2019	ND Graduate School Professional Development Travel Grant (\$741.93)
April 2019	ND Graduate Student Union Conference Presentation Grant (\$100)
April 2018	ND Linked Experimental Ecosystem Facility (LEEF) Research Grant (\$1,500)
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 Course Award (\$1,000)
June 2014	Big XII Dr. Prentice Gautt Postgraduate Scholarship (\$10,000)
May 2012	TCU Science and Engineering Research Center (SERC) Grant (\$1,500)

### **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 (*CryIAB*) 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. Cocke, 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 NO<sub>3</sub><sup>-</sup>-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**<sup>\*</sup>, J.L. Tank, M. Bierzoza, 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**<sup>\*</sup>, J.L. Tank, M. Bierzoza, 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.

# denotes undergraduate/graduate student mentee

\*denotes virtual presentation

+ won 2020 AGU Outstanding Student Presentation Award

<sup>^</sup> denotes plenary speaker

### **Lectures & Seminars:**

1. **S.L. Speir**<sup>\*</sup>. 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. **S.L. Speir**<sup>\*</sup>. Determination of the source of methyl mercury (MeHg) to shoreline spiders using <sup>15</sup>N stable isotopes. TCU Alumni Association Presentation. April 2014.
3. **S.L. Speir**<sup>\*</sup>. Mercury contamination on a global scale. University of Arkansas Stream Ecology Course. December 2014
4. **S.L. Speir**. 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. **S.L. Speir**. From mercury to nitrogen: Swimming across the periodic table. University of Notre Dame Biological Sciences Graduate Student Seminar. October 2016.
6. **S.L. Speir**. 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. **S.L. Speir**<sup>\*</sup>. Decomposition and coarse particulate organic matter. University of Notre Dame Stream Ecology Course. September 2018.
8. **S.L. Speir**<sup>\*</sup> and C.J. Talbot. Hydrology and human impacts on freshwater ecosystems. Indiana Master Naturalist Course. September 2018.
9. **S.L. Speir**. 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. **S.L. Speir\***. Decomposition and nutrient cycling. University of Notre Dame General Ecology Course. April 2019.
10. **S.L. Speir<sup>+</sup>**. Two-stage ditch, cover crops, and water quality. Northwest Indiana Conservation Happenings Meeting. June 2019.
11. **S.L. Speir**. 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. **S.L. Speir**. Quantifying denitrification following two-stage ditch construction in a Midwestern agricultural watershed. University of Notre Dame Biological Sciences Graduate Student Seminar. November 2019.
13. **S.L. Speir**, J.L. Tank, M. Bieroza, U.H. Mahl, T.V. Royer. Characterizing Storm Nitrate Export in Agricultural Watersheds using High-Frequency Sensor Data. University of Notre Dame Biological Sciences Graduate Student Seminar. October 2020.
14. **S.L. Speir\***. Isotope Tracers and Food Webs. University of Notre Dame Stream Ecology Course. November 2020.

\* denotes invited lecturer

<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. Bieroza, 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**<sup>\*</sup>, J.L. Tank, M. Bieroza, 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<sup>\*</sup>, 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**<sup>\*</sup>, 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.

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

\*denotes virtual poster presentation

<sup>+</sup>won second place in Life Sciences category at University of Alabama URCA Conference

### **Workshops:**

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:**

2021-present	Society for Freshwater Science Policy Committee
May 2021	Special Session Co-Organizer, Society for Freshwater Science Annual Meeting
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/>

### **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 & Grant Reviews:** National Science Foundation, Journal of Environmental Quality, Ecosystems, Journal of Geophysical Research: Biogeosciences, Aquatic Sciences, Hydrological Processes

### **Society Membership:**

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

**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