

Matthew J. Berens, Ph.D., P.E.

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Professional Experience

2026 – present	Research Assistant Professor , Clemson University <i>Department of Environmental Engineering and Earth Sciences</i>
2025 – 2026	Environmental Engineer , North Carolina Department of Agriculture & Consumer Services <i>Division of Soil & Water Conservation</i>
2023 – 2025	Postdoctoral Researcher , Oak Ridge National Laboratory <i>Environmental Sciences Division, Plant-Soil Interactions Group</i>
2021 – 2023	Postdoctoral Researcher , Natural Resources Research Institute, Duluth, MN <i>Environmental Geochemistry and Biotechnology Lab, Water Research Group</i>
2015 – 2016	Laboratory Technician , Medtronic, Minneapolis, MN
2012 – 2015	Research Associate , Department of Chemistry, Bethel University (MN)
2012 – 2014	Laboratory Technician , Biogenic Reagents, Circle Pines, MN

Education

2020	Ph.D., Civil Engineering , University of Minnesota <i>Dissertation: Exploring the Reactions and Presence of Munitions Compounds and Insecticides in Aquatic Systems</i> <i>Advisor: Dr. Bill Arnold</i>
2018	M.S., Civil Engineering , University of Minnesota
2015	B.S., Biochemistry/Molecular Biology , Bethel University (MN)
2015	B.A., Chemistry , Bethel University (MN)

Awards and Honors

Postgraduate Awards

2022 Postdoc and Faculty Award for Teaching and Mentoring, University of Minnesota

Student Awards

2021	Best Doctoral Dissertation Award, Civil Engineering, University of Minnesota
2021	Environmental Toxicology & Chemistry Best Paper Award, Finalist
2020	Graduate Student Research Award, ACS Division of Environmental Chemistry
2019	Conference Travel Award, University of Minnesota CECE
2018	Floyd Forsberg Scholarship, Solid Waste Association of North America
2014	NCAA Postgraduate Scholarship recipient

Publications

Peer-reviewed Journal Articles

Google Scholar profile: <https://scholar.google.com/citations?user=I61iU7AAAAJ&hl=en>

11. **Berens MJ**, Schwaner GW., Herndon, EM. (2026). Carbon and nutrient mobilization across inundation gradients in an emerging freshwater delta. *Environmental Processes: Science & Impacts*. [doi:10.1039/D6EM00129G](https://doi.org/10.1039/D6EM00129G)

10. Herndon, E, Pilla, RM, **Berens, MJ**, Schwaner, GW. (2025). Temporal patterns in soil redox potential vary across a freshwater coastal delta. *Hydrological Processes*, 39(11), e70338. [doi:10.1002/hyp.70339](https://doi.org/10.1002/hyp.70339)
9. Guimond, J, Grande, E, Michael, H, Pratt, D, Herndon, E, Noyce, G, Ward, N, Forbich, I, Regier, P, **Berens, MJ**, Arora, B. (2025). The hidden influence of terrestrial groundwater on salt marsh function and resilience. *Nature Water*, 3, 157-166. [doi:10.1038/s44221-024-00384-6](https://doi.org/10.1038/s44221-024-00384-6)
8. Rooney EC, VanderJeugdt, E, Avasarala, S, Miah, I, **Berens, MJ**, Kinsman-Costello, L, Weintraub, M, Herndon, E. (2024). Decoupling of redox processes from soil saturation in Arctic tundra. *Communications Earth & Environment*, 5, 746. [doi:10.1038/s43247-024-01927-1](https://doi.org/10.1038/s43247-024-01927-1)
7. **Berens MJ** et al. (2024). Phosphorus interactions with iron in undisturbed and disturbed Arctic tundra ecosystems. *Environmental Science & Technology*, 58 (26), 11400-11410. [doi:10.1021/acs.est.3c09072](https://doi.org/10.1021/acs.est.3c09072)
6. **Berens MJ**, Deen TW, Chun CL. (2024). Bioelectrochemical reactor to manage anthropogenic sulfate pollution for freshwater ecosystems: Mathematical modeling and experimental validation. *Chemosphere*, 357, 142054. [doi:10.1016/j.chemosphere.2024.142054](https://doi.org/10.1016/j.chemosphere.2024.142054)
5. Tong Y, **Berens MJ**, Ulrich BA, Bolotin J, Strehlau JH, Hofstetter TB, Arnold WA. (2021). Exploring the utility of compound-specific isotope analysis for assessing ferrous iron-mediated reduction of RDX in the subsurface. *Environmental Science & Technology*, 55 (10), 6752-6763. [doi:10.1021/acs.est.0c08420](https://doi.org/10.1021/acs.est.0c08420)
4. **Berens MJ**, Capel PD, Arnold WA. (2021). Neonicotinoid insecticides in surface water, groundwater, and wastewater across land use gradients and potential effects. *Environmental Toxicology & Chemistry*, 40 (4), 1017-1033. [doi:10.1002/etc.4959](https://doi.org/10.1002/etc.4959)
3. **Berens MJ**, Bolotin J, Hofstetter TB, Arnold WA. (2021). Assessment of 2,4-dinitroanisole transformation using CSIA after in situ chemical reduction of iron oxides. *Environmental Science & Technology*, 54 (9), 5520-5531. [doi:10.1021/acs.est.9b07616](https://doi.org/10.1021/acs.est.9b07616)
2. **Berens MJ**, Ulrich BA, Strehlau JH, Hofstetter TB, Arnold WA. (2019). Mineral identity, natural organic matter, and repeated contaminant exposures do not affect the carbon and nitrogen isotope fractionation of 2,4-dinitroanisole during abiotic reduction. *Environmental Science: Processes & Impacts*, 21, 51-62. [doi:10.1039/C8EM00381E](https://doi.org/10.1039/C8EM00381E)
1. Strehlau JH, **Berens MJ**, Arnold WA. (2018). Mineralogy and buffer identity effects on RDX kinetics and intermediates during reaction with natural and synthetic magnetite. *Chemosphere*, 213, 602-609. [doi:10.1016/j.chemosphere.2018.09.139](https://doi.org/10.1016/j.chemosphere.2018.09.139)

Manuscripts In Review

1. **Berens, MJ**, Wood, A, Kolka, K, Chun, C.L. Activated carbon decouples mercury methylation from sulfate reduction in a novel bioelectrochemical treatment system. In review at *ACS ES&T Water*.

Book Chapters

1. Robson MG, Toscano WA, Meng Q, Kaden DA. (2023). Risk Assessment for Environmental Health, 2nd ed.; CRC Press. *Invited*

Published Datasets

Berens MJ, Capel PD, Arnold WA. (2021). Neonicotinoid insecticides in surface water, groundwater, and wastewater across land use gradients and potential effects. *Environmental Toxicology & Chemistry*, 40 (4), 1017-1033. [doi:10.13020/760y-wc14](https://doi.org/10.13020/760y-wc14)

Technical Reports

2. Kolka R, Haight R, Chun CL, **Berens MJ**, Zalensy R, Rogers E, Vinhal R, Nislow K, Perry H, Connolly S. (2022). Mercury Sulfur Initiative; Suggested Program of Research for the Upper Great Lakes States. Gen. Tech. Rep. NRS-206. U.S. Department of Agriculture, Forest Service, Northern Research Station. 28p. [doi:10.2737/NRS-GTR-206](https://doi.org/10.2737/NRS-GTR-206)
1. **Berens MJ**, Tong Y, Strehlau JK, Ulrich BA, Hofstetter TB, Arnold WA. (2021). Compound Specific Isotope Analysis of Mineral-Mediated Abiotic Reduction of Nitro Compounds. Final report to the US Department of Defense for SERDP project ER-2618. [Link to report](#)

Research Grants

Completed Research Grants

- 2022-2023 Mercury methylation and demethylation in human-impacted wetlands during bioelectrochemical treatment of sulfate-rich wastewaters.
PI: **Matthew Berens (NRRI)**
Funding Agency: NRRI Technology Review Board
Amount: \$14,300
- 2021-2023 House Bill 116-448: Sulfur-Mercury Bioaccumulation Research.
PI: Randy Kolka (USDA)
Co-Is: **Matthew Berens (NRRI)**, Chan Lan Chun, Ron Zalensy, Hobie Perry, Ron Haight, Keith Nislow, Stephanie Connolly, Elizabeth Rogers
Funding Agency: USDA-Forest Service
- 2021-2023 Determining the effects of a new class of environmental pollutants produced during wildfires in Minnesota.
PI: **Matthew Berens (NRRI)**
Funding Agency: University of Minnesota Institute on the Environment Mini-Grant
Amount: \$3,000
- 2014 Quantifying the role of pyrogenic carbon materials on nutrient retention in agricultural soils.
PI: **Matthew Berens (Bethel University)**
Funding Agency: Bethel University Edgren Summer Research Fellowship
Amount: \$10,000

User Proposals Awarded (PI unless otherwise noted)

Environmental Molecular Sciences Laboratory

MONet Project 61093 (9/1/2024 – 9/1/2025)
<https://doi.org/10.46936/mone.proj.2024.61093/60012743>

Limited-Scope Project 61094 (3/18/2024 – 6/15/2024)
<https://doi.org/10.46936/lteds.proj.2024.61094/60012488>

Exploratory Project 60557 (12/1/2022 – 9/30/2023, PI Rooney)
<https://doi.org/10.46936/expl.proj.2022.60557/60008721>

Presentations

Invited Talks

- 2025 **Berens MJ**, et al. Career Paths in Environmental Engineering & Science after Graduate School. AEESP 2025 Research and Education Conference, Duke University.
- 2022 **Berens MJ**, Bolotin J, Hofstetter TB, Arnold WA. Assessment of 2,4-dinitroanisole transformation using compound specific isotope analysis after in situ chemical reduction of iron oxides. ACS 2021 Spring Meeting. Department of Environmental Engineering, Michigan Technological University
- 2021 **Berens MJ**, Bolotin J, Hofstetter TB, Arnold WA. Assessment of 2,4-dinitroanisole transformation using compound specific isotope analysis after in situ chemical reduction of iron oxides. Chemistry & Biochemistry Department Seminar, University of Minnesota Duluth
- 2020 **Berens MJ**, Tong Y, Bolotin J, Hofstetter TB, Arnold WA. (2019). Reduction of 2,4-dinitroanisole after in situ chemical reduction of iron oxides in soils. Department of Chemistry, Bethel University

- 2019 **Berens MJ**, Strehlau JH, Ulrich BA, Hofstetter TB, Arnold WA. (2018). Evaluating the effects of matrix conditions and transformation processes on the nitrogen and carbon isotope fractionation of 2,4-dinitroanisole. Water Resources Science Department Seminar, University of Minnesota.

Conference Presentations

- 2024 **Berens MJ**, et al. (2024). Soil organic matter along inundation gradients in an emerging freshwater delta. (Poster, *AGU 2024 Annual Meeting*).
- Berens MJ**, et al. (2024). Landscape and hydrologic controls on solute dynamics in non-perennial headwater streams. (Poster, *2024 Goldschmidt Conference*).
- 2023 **Berens MJ**, Schwaner G, Rovai A, Twilley R, Herndon EH. (2023). Responses of carbon and nutrient solubility to tidal variation in an emerging freshwater coastal delta. (Oral, *AGU 2023 Annual Meeting*).
- Berens MJ**, Schwaner G, Rovai A, Twilley R, Herndon EH. (2023). Biogeochemical controls on nutrient solubility in an emerging freshwater coastal delta. (Oral, *SSSA 2023 International Annual Meeting*).
- Berens MJ**, Schwaner G, Rovai A, Twilley R, Herndon EH. (2023). Evolving phosphorus biogeochemistry in an emerging coastal delta. ORPA Research Symposium, Oak Ridge, TN. (Oral).
- 2022 **Berens MJ**, Kolka R, Chun CL. (2022). Development of an electrochemical bioreactor to treat sulfate-laden wastewater. AEESP National Conference, St. Louis, MO. (Oral).
- Berens MJ**, Kolka R, Chun CL. (2022). Development of an electrochemical bioreactor to treat sulfate-laden wastewater. Gordon Research Conference, Environmental Science: Water, Holderness, NH. (Oral).
- 2021 **Berens MJ**, Capel PD, Arnold WA. (2021). Neonicotinoid insecticides in Minnesota surface and groundwater: Occurrence, trends, and future work. ACS Spring Meeting. (Virtual, Oral).
- 2020 **Berens MJ**, Capel PD, Arnold WA. (2020). Occurrence of Neonicotinoid Insecticides in Minnesota Waters and Their Effects on Aquatic Ecosystems. Minnesota Water Resources Virtual Conference. (Virtual, Oral).
- Berens MJ**, Hofstetter TB, Arnold WA. (2020). Assessment of 2,4-dinitroanisole transformation after in situ chemical reduction of iron oxides using CSIA. ACS Spring Meeting. (Virtual, Oral).
- 2019 **Berens MJ**, Tong Y, Bolotin J, Hofstetter TB, Arnold WA. (2019). Reduction of 2,4-dinitroanisole after in situ chemical reduction of iron oxides. SERDP and ESTCP. Symposium, Washington, DC (Poster)
- Berens MJ**, Strehlau JH, Hofstetter TB, Arnold WA. (2019). Compound specific isotope analysis of nitroaromatic compounds during reaction with Fe-bearing minerals. ACS Spring Meeting, Orlando, FL (Oral).
- 2018 **Berens MJ**, Strehlau JH, Ulrich BA, Hofstetter TB, Arnold WA. (2018). Evaluating the effects of matrix conditions and transformation processes on the nitrogen and carbon isotope fractionation of 2,4-dinitroanisole. Minnesota Water Resources Conference, St. Paul, MN (Poster).
- 2017 **Berens MJ**, Strehlau JH, Ulrich BA, Hofstetter TB, Arnold WA. (2017). Mineral-mediated attenuation of 2,4-dinitroanisole in groundwater systems. Minnesota Water Resources Conference, St. Paul, MN (Poster).
- Berens MJ**, Strehlau JH, Ulrich BA, Hofstetter TB, Arnold WA. (2017). Mineral-mediated attenuation of nitroaromatic contaminants in groundwater systems. SETAC North America, Minneapolis, MN (Oral).

Teaching and Mentoring

Graduate/Advanced Undergraduate Courses (University of Minnesota Duluth)

CE 5241: Environmental Water Chemistry	Spring 2021
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Undergraduate and Core Courses (University of Minnesota Duluth)

ESCI 4280: Principles of Soil Science	Fall 2022
CE 3025: Environmental Engineering	Spring 2022
CHEM 2212: Environmental Chemistry	Fall 2021

Graduate/Advanced Undergraduate Courses (University of Minnesota)

CEGE 4526: Environmental Remediation Technologies Spring 2020

Teaching Assistantships

CEGE 8542: Environmental Organic Chemistry, University of Minnesota (Spring 2019)

CEGE 5541: Environmental Water Chemistry, University of Minnesota (Fall 2019)

CHEM 410: Instrumental Analysis, Bethel University (MN) (Spring 2014)

CHEM 210: Accelerated General Chemistry, Bethel University (Fall 2013)

CHEM 110: General Chemistry, Bethel University (Fall 2012)

Graduate Student Advisees

Jahid Javed, M.S. Water Resource Science, University of Minnesota Duluth (2022-2023)

Caitlin Graber, M.S. Civil Engineering, University of Minnesota Duluth (2019-2020)

Grant Goedjen, Ph.D. Civil Engineering, University of Minnesota (2019-2020)

Undergraduate Student Advisees

Vivian Gerstein, Science Undergraduate Laboratory Internship (SULI), ORNL (summer 2024)

Ethan White, Research Student Internship (RSI), ORNL (summer 2024)

Georgie McDevitt, Science Undergraduate Laboratory Internship (SULI), ORNL (spring 2024)

Kayla Summerlot, Science Undergraduate Laboratory Internship (SULI), ORNL (2023)

Braden Kohn, B.S. Chemical Engineering, University of Minnesota Duluth (2022-2023)

Braeden Cox, B.S. Civil Engineering, University of Minnesota Duluth (2022)

Julia Bensen, B.S. Chemistry, University of Minnesota (2020)

Caroline Dewey, B.S. Chemistry, University of Minnesota (2020)

Kolton Kitterman, B.S. Chemistry, University of Minnesota (2018-2019)

Samuel Lombardo, B.S. Civil Engineering, University of Minnesota (2016-2019)

Service and Outreach

Reviewer for JGR: Biogeosciences; Environmental Science & Technology; Water Research; Environmental Science: Processes & Impacts; Environmental Science: Water Research & Technology; Aquatic Sciences; Minerals; Journal of Hazardous Materials; Environmental Toxicology; mSphere; Biogeochemistry; RSC Advances.

Proposal Reviewer for Environmental Molecular Sciences Laboratory Exploratory Research program (2023–present)

Technical Reviewer for NEON Aquatic Biogeochemistry Technical Working Group (2023–present)

Proposal Reviewer for Environmental Molecular Sciences Laboratory Large Scale Research program (2023–present)

Volunteer Instructor for Kids in the Creek – Eight Grade Water. Henderson County, NC (2025–present)

Volunteer Instructor for [U.S. DOE “Get into Green”](#) at the ORNL Traveling Science Fair (2023–2024)

Guest Instructor/Activity Leader for [DOE Science Advancing Girls’ Engagement in STEM Camp](#) (2023-2024)

Committee Member for AEESP Student Services Committee (2021–2024)

Co-chair of University of Minnesota Postdoctoral Association Steering Committee (2021–2022)

Guest Speaker, Scientists in the Classroom at North Middle School, Lenoir City, TN (2024)

Volunteer Instructor for MN Sea Grant, [St Louis River Quest](#) (2022)

Scientific Judge for Northeast MN American Indian Science and Engineering Fair (2022)

After School Mentor and Tutor for Denfeld Area Senior High School, Duluth, MN (2021)

Guest Speaker for STARBASE Minnesota STEM Program (2021–2022)

Guest Speaker for Skype a Scientist (2021)

Diversity, Equity, and Inclusivity Training and Experience

- 2023 **ADVANCEGeo Workshop**, bystander intervention training program for ORNL, 3 hrs.
- 2021 **Anti-Racism Committee**, postdoctoral representative, University of Minnesota Duluth
- 2020 **CSE Diversity & Inclusivity Alliance**, member, University of Minnesota
- 2020 **CEGE Diversity & Equity Committee**, graduate student representative, University of Minnesota

Conference Organization

- 2024 **Session Convener**, *Non-perennial and variably inundated Ecosystems: Interdisciplinary investigations of hydrologic and ecosystem connectivity* – AGU24 Annual Meeting, Washington, D.C., USA
- Session Convener**, *Observing and modeling biogeochemistry in rapidly changing coastal ecosystems* – 2024 Goldschmidt Conference, Chicago, USA

Scientific Workshop Participation and Other Training

- 2025 **Applied Fluvial Geomorphology (Level I)**, Wildland Hydrology
- 2023 **George Gopin Proposal Writing Workshop**, ORNL
- 2021 **IsoCamp**, University of Arizona
- Triple Oxygen Isotopes Short Course**, University of Arizona
- 2020 **Teaching Assistant and Postdoc Professional Development Program**, UMN
- Winter Coring and Core Processing/Description**, Continental Scientific Drilling Facility, UMN
- 2019 **Speaking Science Workshop**, Minneapolis, MN
- 2018 **Preparing Future Faculty Program**, UMN
- 2017 **Advanced Data Analysis with R**, UMN

Media Coverage

- 2023 [“Firsthand fieldwork: ORNL scientists establish monitoring in at-risk coastal ecosystem.”](#) News feature by Oak Ridge National Laboratory. Published May 18, 2023.
- 2022 [“Young researchers do complex work with a simple truth: Natural resources at the center.”](#) News feature in the Star Tribune. Published October 20, 2022.

2020 [“Researchers find insecticides widespread in Minnesota lakes and rivers.”](#) Interview with Minnesota Public Radio. Posted December 21, 2020.

Professional Affiliations (current)

American Geophysical Union (AGU); Soil Science Society of America (SSSA); Geochemical Society (GS); Association of Environmental Engineering and Science Professors (AEESP)

Certifications and Licensures

Professional Engineer, Licensed in the state of North Carolina. No. 060477 (2025–present)
10-hour General Industry Safety and Health Certification, OSHA (2025–present)