Matthew J. Berens

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Professional Appointments

Postdoctoral Research Associate, Oak Ridge National Laboratory — 2023 – present
Environmental Science Division, Plant-Soil Interactions Group
Advisor: Dr. Elizabeth Herndon

Postdoctoral Research Associate, Natural Resources Research Institute, Duluth, MN — 2021 – 2023
Environmental Geochemistry and Biotechnology
Advisor: Dr. Chan Lan Chun

Laboratory Technician, Medtronic, Minneapolis, MN — 2015 – 2016

Research Associate, Department of Chemistry, Bethel University (MN) — 2012 – 2015

Education

Ph.D., Civil Engineering, University of Minnesota – Twin Cities — 2020
Dissertation: Exploring the Reactions and Presence of Munitions Compounds and Insecticides in Aquatic Systems
Advisor: Dr. William A. Arnold

M.S., Civil Engineering, University of Minnesota – Twin Cities — 2018

B.S., Biochemistry/Molecular Biology, Bethel University (MN) — 2015

B.A., Chemistry, Bethel University (MN) — 2015

Peer-Reviewed Journal Articles

Google Scholar profile: https://scholar.google.com/citations?user=l61iU7AAAAAJ&hl=en

2021 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

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

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

2019 **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-dinitroanisiole during abiotic reduction. *Environmental Science: Processes & Impacts*, 21, 51-62. doi:10.1039/C8EM00381E

2018 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

Shared Data Products

2021 **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

Peer-Reviewed Book Chapters

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

Manuscripts in Progress

In prep. **Berens MJ**, Michaud AB, Emerson D, Bowden BB, Herndon EH. Anthropogenic disturbance disrupts phosphorus retention in Arctic tundra soils. (anticipated submission to *Environmental Science & Technology Letters*)

Berens MJ, Ogorek JM, Kolka R, Chun CL. Mercury methylation and demethylation during bioelectrochemical treatment of sulfate-rich wastewaters.

Berens MJ, Kolka R, Chun CL. Biogeochemical manipulation of contaminated soils for sulfur remediation in mining-impacted wetlands.

Berens MJ, Deen T, Chun CL. Mathematical modeling and application of an electrode-integrated fixed-bed bioreactor for biological sulfate treatment.

Technical Reports

2022 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

2021 **Berens MJ**, Tong Y, Strehlau JK, Ulrich BA, Hofstetter TB, Arnold WA. 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. 2021. Link to report

Honors and Awards

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

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 CEGE

2015 **Floyd Forsberg Scholarship**, Solid Waste Association of North America

2014 **NCAA Postgraduate Scholarship**

2014 **Edgren Summer Research Fellowship**, Bethel University

Research Grants

Active Grants

2022-2024 EMSL with Erin
PI: Erin Rooney (UTK)
Co-Is: **Matthew Berens (ORNL)**, Elizabeth Herndon (ORNL)
Amount:

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
Funding Agency: USDA-Forest Service
Amount to NRRI: $200,000

2022-2023 Mercury methylation and demethylation during bioelectrochemical treatment of sulfate-rich wastewaters.
PI: **Matthew Berens (NRRI)**
Funding Agency: NRRI Technology Review Board
Amount: $14,3000

Completed Research Grants

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

Workshop Participation and Other Training

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

Invited Talks

2022 Department of Environmental Engineering, Michigan Technological University

2021 Chemistry & Biochemistry Department, University of Minnesota Duluth

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. (Virtual, Oral)

2020 Department of Chemistry, Bethel University

2019 Water Resources Science Department, University of Minnesota

Conference Presentations

2023 **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 Experience

2022 **CHEM 2212: Environmental Chemistry,** Guest Lecturer. University of Minnesota Duluth

CE 3025: Environmental Engineering, Lecturer. University of Minnesota Duluth

ESCI 4280: Principles of Soil Science, Guest Lecturer. University of Minnesota Duluth

2021 **CE 5241: Environmental Water Chemistry,** Guest Lecturer. University of Minnesota Duluth

2020 **CEGE 4526: Environmental Remediation Technologies,** Guest Lecturer, University of Minnesota

2019 **CEGE 8542: Environmental Organic Chemistry,** Guest Lecturer. University of Minnesota

CEGE 5541: Environmental Water Chemistry, Teaching Assistant. University of Minnesota

2015 **CHEM 480: Senior Seminar,** Guest Lecturer. Bethel University (MN)

2014 **CHEM 410: Instrumental Analysis,** Teaching Assistant. Bethel University (MN)

2013 **CHEM 210: Accelerated General Chemistry,** Teaching Assistant. Bethel University (MN)

2012 **CHEM 110: General Chemistry,** Teaching Assistant. Bethel University (MN)

Mentorship and Advising

Graduate level	**Jahid Jabed,** M.S. Water Resource Science, University of Minnesota Duluth (2023)
	Caitlin Graber, M.S. Civil Engineering, University of Minnesota Duluth (2022)
	Grant Goedjen, Ph.D. Civil Engineering, University of Minnesota (2020)
Undergraduate level	**Kaylie,** SULI intern, ORNL (2023)
	Braden Kohn, B.S. Chemical Engineering, University of Minnesota Duluth (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 (2019)
	Samuel Lombardo, B.S. Civil Engineering, University of Minnesota (2019)

Service

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

Proposal reviewer for Environmental Molecular Sciences Laboratory Large Scale Research proposal reviewer (2023–present)

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

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

Volunteer Instructor for MN Sea Grant, Science 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)

Media Coverage

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 Chemical Society (ACS); American Geophysical Union (AGU); Soil Science Society of America (SSSA); Association of Environmental Engineering & Science Professors (AEESP)

Academic and Research Advisors

Elizabeth Herndon	Oak Ridge National Laboratory (Postdoc)
Chan Lan Chun	Natural Resources Research Institute (Postdoc)
William Arnold	University of Minnesota (graduate)
Brandon Winters	Bethel University (undergraduate)