Matthew J. Berens

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Postdoctoral Research Associate
Environmental Science Division
Oak Ridge National Laboratory

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

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

Publications

Peer-Reviewed Journals

1. 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
2. **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
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
4. **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
5. 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

Published Datasets

1. **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

Contributed Book Chapters

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

Government Reports and Publications

1. 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
2. **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
2022 Best Doctoral Dissertation Award, Civil Engineering, University of Minnesota
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

Grants and Fellowships Funding

2021 – 2023 (Co-I) House Bill 116-448: Sulfur-Mercury Bioaccumulation Research. PI: Randy Kolka (USDA-FS). $2,000,000

2022 – 2023 (PI) Mercury methylation and demethylation during bioelectrochemical treatment of sulfate-rich wastewaters. Natural Resources Research Institute research grant. $14,300

2021 – 2023 (PI) Determining the effects of a new class of environmental pollutants produced during wildfires in Minnesota. University of Minnesota Institute on the Environment Mini-Grant. (PI)

Workshops and Other Training

2021 IsoCamp, University of Arizona
2021 Triple Oxygen Isotopes Short Course, University of Arizona
2020 Teaching Assistant and Postdoc Professional Development Program, UMN
2020 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

Presentations

Invited Seminars

2022 Department of Environmental Engineering, Michigan Technological University
2021 Chemistry & Biochemistry Department, University of Minnesota Duluth

2020 Department of Chemistry, Bethel University
2019 Water Resources Science Department, University of Minnesota

Invited Conference Presentations

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. ACS 2021 Spring Meeting. (Virtual, Oral)

Conference Presentations

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

University of Minnesota Duluth

CHEM 2212, Environmental Chemistry, Guest Lecturer	2022
CE 3025, Environmental Engineering, Lecturer	2022
ESCI 4280, Principles of Soil Science, Guest Lecturer	2022
CE 5241, Environmental Water Chemistry, Guest Lecturer	2021

University of Minnesota

CEGE 4526, Environmental Remediation Technologies, Guest Lecturer	2020
CEGE 8542 Environmental Organic Chemistry, Guest Lecturer	2019
CEGE 5541, Environmental Water Chemistry, Teaching Assistant	2019

Bethel University

CHEM 480, Senior Seminar, Guest Lecturer	2015
CHEM 410, Instrumental Analysis, Teaching Assistant	2015
CHEM 210, Accelerated General Chemistry, Teaching Assistant	2014
CHEM 110, General Chemistry, Teaching Assistant	2013
CHEM 110, General Chemistry, Teaching Assistant	2012

Mentorship and Advising

Graduate Students Advised

Jahid Jabed	M.S. Water Resource Science, University of Minnesota Duluth (anticipated 2024)
Caitlin Graber	M.S. Civil Engineering, University of Minnesota Duluth (2022)
Grant Goedjen	Ph.D. Civil Engineering, University of Minnesota (2020)

Undergraduate Students Advised

Braden Kohn	B.S. Chemical Engineering, University of Minnesota Duluth (anticipated 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)

Laboratory Researchers

Allison Byrd	Natural Resources Research Institute (2021–2022)

Service

Manuscript Reviewer

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

Professional Society Service

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

University of Minnesota

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

Educational Outreach

- Volunteer Instructor, MN Sea Grant, Science Quest (2022)
- Scientific Judge, Northeast MN American Indian Science and Engineering Fair (2022)
- After School Mentor and Tutor, Denfeld Area Senior High School, Duluth, MN (2021)
- Guest Speaker, STARBASE Minnesota STEM Program (2021–2022)
- Guest Speaker, Skype a Scientist (2021)

Media

Neonicotinoid Insecticides in Surface Water, Groundwater, and Wastewater across Land Use Gradients and Potential Effects, Minnesota Public Radio, 2020. Gunderson, D. Researchers find insecticides widespread in Minnesota lakes and rivers.

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)