

Andrew M. Graham
Department of Chemistry
Grinnell College
1116 8th Avenue, Grinnell, IA 50112-1690
grahaman@grinnell.edu

EDUCATION

- 2010 Ph.D., Environmental Engineering
Johns Hopkins University, Baltimore, Maryland (Advisor: Prof. Edward Bower)
Dissertation: *Chromium Fate and Speciation in Anoxic Estuarine Sediments: the Role of Reduced Iron-Sulfur Minerals*
- 2007 M.S., Environmental Engineering
Johns Hopkins University, Baltimore, Maryland
- 2003 B.A., Geology
Earlham College, Richmond, Indiana
College and Departmental Honors
Thesis: *Vertical Distribution of Heavy Metals in Springwood Lake Sediments, Richmond, Indiana*

PROFESSIONAL EXPERIENCE

- 8/1/2019-present: Associate Professor of Chemistry (with tenure), Grinnell College, Grinnell, IA
- 8/1/2012-7/31/2019: Assistant Professor of Chemistry, Grinnell College, Grinnell, IA
- 10/15/2010-7/1/2012: Postdoctoral Research Fellow, Smithsonian Environmental Research Center, Edgewater, MD (Supervisor: Dr. Cynthia Gilmour)
- 8/1/2005-9/30/2010: Research Assistant, Johns Hopkins University
Department of Geography and Environmental Engineering
- 9/1/2008-12/15/2008 Teaching Assistant, Johns Hopkins University
Department of Geography and Environmental Engineering
Engineering Microbiology
- 8/1/2003-6/15/2005 Special Education Teacher
Beaumont High School, St. Louis, Missouri
Teach For America Corps Member

HONORS AND AWARDS

- 2010 Smithsonian Institution Postdoctoral Fellowship Recipient
- 2010 American Chemical Society Division of Environmental Chemistry
Graduate Student Award

- 2006 National Science Foundation Graduate Research Fellowship Recipient
- 2005 Johns Hopkins University Whiting School of Engineering Abel Wolman Graduate Fellowship Recipient
- 2003 Phi Beta Kappa, Earlham College Chapter

PUBLICATIONS

Published:

Graham, A.M., Van Helten, S.*, Wadle, A.*, Mamrak, E.A.*, Morsch, J.*, Lopez, S.*, and Smith, K.L.* Mercury transport and methylmercury production in the lower Cedar River (Iowa) floodplain. 2023. *Frontiers in Environmental Chemistry*. 4:1242813. doi:10.3389/fenvc.2023.1242813

Brunet, C.*, Gemrich, E.*, Biedermann, S.*, Jacobson, P., Schilling, K., Jones, C., **Graham, A.M.** (2021). Nutrient capture in an Iowa farm pond: Insights from high-frequency observations. *Journal of Environmental Management* 299: 113647.

West, J. **Graham, A.M.**, Liem-Nguyen, V., Jonsson, S. (2020). Dimethylmercury degradation by dissolved sulfide and mackinawite. *Environ. Sci. Technol.* 54: 13731-13738. DOI: <https://dx.doi.org/10.1021/acs.est.0c04134>

Graham, A.M. (2019) Dissolved organic matter interactions with mercury in the Florida Everglades. In: *Mercury and the Everglades – A Synthesis and Model for Complex Ecosystem Restoration, Vol III*. Axelrad, D.M., Rumbold, D., and Pollman, C., Eds. Springer International Publishing. https://doi.org/10.1007/978-3-030-32057-7_4

Kanzler, C.R.*, Lian, P., Trainer, E.L.*, Yang, X.*, Govind, N., Parks, J.M., and **Graham, A.M.** (2018). Emerging Investigator Series: Methylmercury speciation and dimethylmercury production in sulfidic solutions. *Environ. Sci. Process. Impacts* 20: 584-594 (Best Papers 2018, HOT article, cover article)

Graham, A.M., Cameron-Burr, K.T.*, Hajic, H.*, Lee, C.*, Msekela, D.*, and Gilmour, C.C. Sulfurization of dissolved organic matter increases Hg-sulfide-DOM bioavailability to a Hg-methylating bacterium. *Environmental Science and Technology* 51: 9080-9088.

Gilmour, C.C., M. Podar, A.L. Bullock, **A.M. Graham**, S.D. Brown, A.C. Somenhally, A. Johs, R.A. Hurt, Jr., K.L. Bailey, and D.A. Elias (2013). Mercury methylation by novel microorganisms from new environments. *Environmental Science and Technology* 47: 11810-11820.

Graham, A.M., G.R. Aiken, and C.C. Gilmour (2013). Effect of dissolved organic matter source and character on microbial Hg methylation in Hg-S-DOM solutions. *Environmental Science and Technology*, 47: 5746-5754.

Graham, A.M., A.L. Bullock, A.C. Maizel, D.A. Elias, and C.C. Gilmour (2012). Detailed assessment of the kinetics of Hg-cell association, Hg methylation, and methylmercury degradation in several *Desulfovibrio* species. *Applied and Environmental Microbiology*, 78: 7337-7346.

Graham, A.M., G.R. Aiken, and C.C. Gilmour (2012). Dissolved organic matter enhances microbial mercury methylation under sulfidic conditions. *Environmental Science and Technology*, 46: 2715-2723.

Graham, A. M. and E. J. Bouwer (2012). Oxidative dissolution of pyrite surfaces by hexavalent chromium: surface site saturation and surface renewal. *Geochimica et Cosmochimica Acta* 83: 379-396.

Graham, A. M. and E. J. Bouwer (2010). Rates of Hexavalent Chromium Reduction in Anoxic Estuarine Sediments: pH Effects and the Role of Acid Volatile Sulfides. *Environmental Science and Technology*, 44: 136-142.

Graham, A. M., A. R. Wadhawan, and E. J. Bouwer (2009). Chromium Occurrence and Speciation in Baltimore Harbor Sediments and Porewater, Baltimore, Maryland, USA. *Environmental Toxicology and Chemistry*, 28: 471-480.

***Denotes Grinnell College Undergraduate Student**

PRESENTATIONS (Last 5 years)

Oeste, R., Wanamaker, A.D., Thatcher, D., Denniston, R.F., **Graham, A.M.**, Polyak, V.J., Regala, F.T., Asmerom, Y. Marine Isotope Stage 4 changes in hydroclimate of southern Portugal. Geological Society of America North Central Section Meeting. May 4-5, 2023. Grand Rapids, Michigan.

Gindorf, S., West, J., **Graham, A.M.**, Jonsson, S. Photodegradation of mono- and dimethylmercury in natural water. Goldschmidt Conference July 9-14, 2023. Lyon, France.

Jonsson, S., West, J., Gindorf, S., **Graham, A.M.** Role of dimethylmercury in marine waters. American Geophysical Union, Dec 12-16, 2022. Chicago, Illinois.

Getachew, F.* **Graham, A.M.** Geochemical controls on Hg biogeochemistry at Swamp White Oak (SWO), Eastern Iowa. American Chemical Society Midwest Regional Meeting, Oct 19-21, 2022. Iowa City, Iowa.

Szlembarska, A.* **Graham, A.M.** Controls on Hg methylation and demethylation rates in wetland sediments as inferred from enriched stable isotope tracer experiments. American Chemical Society Midwest Regional Meeting, Oct 19-21, 2022. Iowa City, Iowa.

Grindle, T.* **Graham, A.M.** Controls on phosphorus capture in farm ponds: Does internal phosphorus loading limit efficacy of this BMP? American Chemical Society Midwest Regional Meeting, Oct 19-21, 2022. Iowa City, Iowa.

West, J. Gindorf, S., **Graham, A.M.**, Jonsson, S. Photochemical degradation of dimethylmercury in natural waters. 15th International Conference on Mercury as a Global Pollutant. July 25-29, 2022, online.

Weber, S.* Szlembarska, A.* Peng, L.* **Graham, A.M.** Controls on MeHg uptake and degradation by several anaerobic bacteria. 15th International Conference on Mercury as a Global Pollutant. July 25-29, 2022, online.

Cook, B*, Thatcher, D., **Graham, A.M.**, Wanamaker, A.D., Denniston, R.F., Gillikin, D., Asmerom, Y., Polyak, V.J., Ummenhofer, C. A 2500-year record of hydroclimate variability as evidenced by laser ablation analysis of trace elements and stable isotopes in Portuguese speleothems. 55th Annual Meeting of North-Central Section of the Geologic Society of America. April 18-20, 2021, online. Poster.

West, J., **Graham, A.M.**, Nguyen, L., Jonsson, S. Dimethylmercury demethylation in the presence of sulfide. European Geophysical Union General Assembly, May 4-8, 2020, online.

Mehltretter, K.*, **Graham, A.M.**, Marzluff, E. Herbicide fate and transport in an agricultural watershed. American Chemical Society Midwest Regional Meeting. October 21-23, 2018, Ames, Iowa. Poster.

Graham, A.M. Mercury biogeochemistry in the Cedar River Floodplain. University of Iowa, Food Energy Water Nexus Seminar, Civil and Environmental Engineering. April 13, 2018.

Brunet, C.* and **Graham, A.M.** 2018. Nutrient processing and storage in agricultural streams and ponds as revealed by high frequency observation. 255th American Chemical Society National Meeting, New Orleans, Louisiana. Poster.

Smith, K.* and **Graham, A.M.** 2018. Mercury methylation and bioaccumulation in an Iowa terrace-fen complex. 255th American Chemical Society National Meeting, New Orleans, Louisiana. Poster.

Wadle, A.* and **Graham, A.M.** 2018. Microtopographic control of groundwater geochemistry and Hg methylation in a river floodplain. 255th American Chemical Society National Meeting, New Orleans, Louisiana. Poster.

*Denotes Grinnell College Undergraduate Student

GRANT AWARDS

Graham, A.M. MCA: *Developing a Paleorecord of Hg in Long-Lived Mollusks from the Gulf of Maine*. National Science Foundation Award 2322048. 9/1/23 through 8/31/26. \$237,317. With collaborators Diana Thatcher and Elizabeth Swanner at Iowa State University.

Graham, A.M., Sharpe, L., Jacobson, P., Kamunde-Devonish, M. MRI: *Acquisition of an ICP-MS Supporting Interdisciplinary Undergraduate Research in Biogeochemistry, Materials Science, Archaeological Chemistry, and Bioinorganic Chemistry*. National Science Foundation Award 1919696. 2019-2022. \$349,685

Graham, A.M. and Jacobson, P.J. *Bringing CERA to Campus: An Environmental Monitoring Array for Teaching, Learning, and Research*. Grinnell College Innovation Fund 2017-2019. \$58,368.

Brown, J., Eckhart, V. Jacobson, P., Jacobson, K., **Graham, A.**, Hill, E., McKone, M. Hernandez, D., Braker, N., Shea, K., Angell, D., Freedberg, S., Mohl, E., Porterfield, J., Nelson, N., Allison, S., Adelsberger, K., Mountjoy, J., Templeton, J. Associated Colleges of the Midwest FaCE Grant: Fostering long-term, collaborative research in environmental science at ACM field stations. \$32,255

COURSES TAUGHT

Introduction to Earth Systems Science (Fall 2012, 2013, 2014, 2015, 2017, 2018, 2019, 2022, 2023)
Introduction to Earth Systems Science Lab (Fall 2012, 2013, 2014, 2015, 2017, 2018, 2019, 2021, 2022,

2023)

Introduction to Inorganic and Analytical Chemistry Lab (Fall 2012, Spring 2015, Spring 2016, Spring 2018, Spring 2019, Fall 2019, Fall 2021, Spring 2022, Fall 2022)

Introduction to Inorganic and Analytical Chemistry (Spring 2013, Fall 2013, Spring 2016, Spring 2020, Spring 2023)

Analytical Chemistry Lab (Spring 2024)

Analytical Chemistry (Spring 2024)

Environmental Chemistry (Spring 2013, 2016, 2019, 2023)

Tutorial: Contested Waters of the American Southwest (Fall 2014, 2018)

Tutorial: Cli-Fi: Reckoning with Climate Change Through Fiction (Fall 2021)

Aquatic Geochemistry (Spring 2015, 2018, 2020, 2022, 2024)

Senior Seminar: The Food Energy Water Nexus (Fall 2017)

STUDENT MENTORSHIP

37 total Grinnell undergraduates advised in independent research

Ph.D. supervisor (committee member), Johannes West, Stockholm University

PROFESSIONAL ASSOCIATIONS

International Association of Geoanalysts

Geologic Society of America

National Association of Geoscience Teachers

Midwest Association of Chemistry Teachers in Liberal Arts Colleges

JOURNAL REFEREE (last ~1 year)

Environmental Science and Technology

Environmental Science and Technology Letters

Environmental Science: Processes and Impacts (Outstanding Reviewer in 2022)

Frontiers in Environmental Chemistry

PROFESSIONAL DEVELOPMENT

Beyond GSP (Grinnell Science Project): Part II. Workshop Facilitator. Grinnell College, June 27-30, 2022.

Workshop Co-Facilitator. Perspectives on Methylmercury Demethylation in Natural Environments. 14th International Conference on Mercury as a Global Pollutant. Krakow, Poland, Sept 8th, 2019.

Beyond GSP (Grinnell Science Project). Workshop Facilitator. Grinnell College, June and July, 2019

Midstates Consortium for Math and Science New Faculty Workshop: Strategic Planning for Early-Career Success, July 2012

The Inclusive Classroom: Practical Strategies for Diverse Classrooms. Workshop at Grinnell College, Aug 6-10, 2012.

SERVICE AND OUTREACH

2022-present Admissions and Financial Aid Committee, Grinnell College

2021-2022 Health Professions Advisory Committee, Grinnell College

2020-present Chair, Environmental Studies, Grinnell College
2020-present Working Group for Diversity and Inclusion in the Sciences, Grinnell College
2020-2022 Committee on Diversity and Inclusion, Grinnell College
2018-2019 Co-Director, Grinnell Science Project
2018-2019 Grinnell College Sustainability Committee
2017-2019 Instructional Support Committee, Grinnell College
2015 Chemistry Summer Research Director
2013-2015 Faculty Laboratory Mentor, Grinnell Science Project
2014-2016 Center for Prairie Studies Advisory Board, Grinnell College
2014-present Conard Environmental Research Area (CERA) Advisory Board, Grinnell College
2015-2016 Convocation Committee, Grinnell College
2013-2016 Teacher Education Committee, Grinnell College