

MARGARET ANNE G. HINKLE

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EDUCATION

Ph.D. (September 2010 – May 2015) in Earth & Planetary Sciences, Washington University in St. Louis. Dissertation: "Ion interactions at the mineral-water interface during biogeochemical iron and manganese cycling." *Advisor*: Prof. Jeffrey G. Catalano

A.M. (September 2010 – May 2012) in Earth & Planetary Sciences, Washington University in St. Louis. *Advisor*: Prof. Jeffrey G. Catalano

B.S. (September 2005 – May 2009) in Chemistry (academic minor: Anthropology), Sewanee: The University of the South, cum laude. *Research Advisor*: Prof. Robert E. Bachman, *Advisor*: Prof. John H. Shibata

PROFESSIONAL EXPERIENCE

Assistant Professor (2017-present) Earth & Environmental Geosciences, Washington & Lee University

Affiliate Faculty Member (2018-present) Environmental Studies Program, Washington & Lee University

Research Associate (2018-2021) Mineral Sciences Department, National Museum of Natural History, Smithsonian Institution

Peter Buck Postdoctoral Fellow (2015-2017) Mineral Sciences Department, National Museum of Natural History, Smithsonian Institution

PEER-REVIEWED PUBLICATIONS

*denotes corresponding author

‡denotes undergraduate student

1. ***Hinkle M.A.G.**, Ziegler B., ‡Culbertson H., ‡Goldmann C., ‡Croy M.E., ‡Willis N., Ling E., Reinhart B., Lyon E.C. (2024) "Manganese exposure from spring and well waters in the Shenandoah Valley: interplay of aquifer lithology, soil composition, and redox conditions." *Environmental Geochemistry and Health* **46**, 203, 1-27. [[link](#)]
2. ***Hinkle M.A.G.**, Post J.E., ‡Peralta J., Santelli C.M. (2023). "Impacts of sulfonic acids on fungal manganese oxide production." *Geochimica et Cosmochimica Acta* **341**, 164–182. [[link](#)]
3. *Rosenfeld, C.E., Sabuda M.C., **Hinkle M.A.G.**, James B. R. (2020) "A fungal-mediated cryptic selenium cycle linked to manganese biogeochemistry." *Environmental Science & Technology* **54**, 3570 - 3580. [[link](#)]
4. ***Hinkle M.A.G.**, Becker K.G., Catalano J.G. (2017) "Impact of Mn(II)-manganese oxide reactions on Ni and Zn speciation." *Environmental Science & Technology* **51**, 3187-3196. [[link](#)]
5. ***Hinkle M.A.G.**, Flynn E.D., Catalano J.G. (2016) "Structural response of phyllo-manganates to wet aging and Mn(II)." *Geochimica et Cosmochimica Acta* **192**, 220-234. [[link](#)]

6. *Arvidson R.E., Squyres S.W., Morris R.V., Knoll A.H., Gellert R. Clark B.C., Catalano J.G., Jolliff B.L., McLennan S.M., Herkenhoff K.E., VanBommel S., Mittlefehldt D.W., Grotzinger J.P., Guinness E.A., Johnson J.R., Bell III J.F., Farrand W.H., Stein N., Fox V.K., Golombek M.P., **Hinkle M.A.G.**, Calvin W.M., Desouza Jr. P.A. (2016) “High concentrations of manganese and sulfur in deposits on Murray Ridge, Endeavour Crater, Mars.” *American Mineralogist* 101, 1389-1405. [[link](#)]
7. ***Hinkle M.A.G.** and Catalano J.G. (2015) “Effect of phosphate and sulfate on Ni repartitioning during Fe(II)-catalyzed Fe(III) oxide mineral recrystallization.” *Geochimica et Cosmochimica Acta* **165**, 62-74. [[link](#)]
8. ***Hinkle M.A.G.**, Wang Z., Giammar D.E., Catalano J.G. (2015) “Interaction of Fe(II) with phosphate and sulfate on iron oxide surfaces.” *Geochimica et Cosmochimica Acta* **158**, 130-146. [[link](#)]
9. *Bachman R.E., Bodolosky-Bettis S.A., Pyle C.J., **Gray M.A.** (2008) “Reversible oxidative addition and reductive elimination of fluorinated disulfides at gold (I) thiolate complexes: A new ligand exchange mechanism.” *Journal of the American Chemical Society* **130**, 14303-14310. [[link](#)]

OTHER (NON-PEER REVIEWED) PUBLICATIONS

1. **Hinkle M.A.G.**, Lyon E.C. (2023) “Assessing ground and surface water quality at redox interfaces across the Shenandoah Valley, Virginia.” Proceedings of the Keck Geology Consortium, Volume 34. doi:10.18277/AKRS.G.2022.34.06 [[link](#)]

MANUSCRIPTS UNDER PEER REVIEW

*denotes corresponding author
‡denotes undergraduate student

1. ***Hinkle M.A.G.**, Rosenfeld C.E., ‡Teagle S., Post J., Santelli C.M. “Mycogenic manganese oxide structural changes and progressive nickel incorporation with aging.” *Under review, submitted August 2024.*

PRESENTATIONS

Conference Presentations

*denotes presenting authors
‡denotes undergraduate student
∞denotes postdoctoral fellow in Hinkle Lab

1. ***Hinkle, M.A.G.**, Ling F., ‡Teagle S.G., Heaney P., Post J. (2023) “Optimizing manganese remediation from coal mine drainage: The role of mineral structures, microbes, and liner rocks.” Oral presentation by Hinkle at the Geological Society of America Conference, Pittsburgh, PA, Oct. 2023.
2. ‡Edwards J., *‡Nguyen P.M.N., Teagle S.G., **Hinkle M.A.G.** (2023) “Improving a novel “mycozeo” passive manganese bioremediation system: Comparative efficacy of coal mine drainage remediation by mined, washed, and synthetic zeolites.” Poster presentation by students Edwards and Nguyen at the Geological Society of America Conference, Pittsburgh, PA, Oct. 2023.
3. ∞Chakraborty M., ‡Goldmann C., Ziegler B., Lyon E.C., **Hinkle M.A.G.** (2023) “Probabilistic mapping of high-hazard zones of dissolved manganese and iron in groundwater of the Shenandoah Valley, Virginia.” Oral presentation by Chakraborty at the Geological Society of America Conference, Pittsburgh, PA, Oct. 2023.

4. *†Nguyen P.M.N., †Dorman E., *†Teagle S.G., **Hinkle M.A.G.** (2022) “Improving coal mine drainage manganese bioremediation: The impacts of different liner rocks and of competitive copper adsorption.” Poster presentation (won session student presenter award) by students Nguyen and Teagle at the Geological Society of America Conference, Denver, CO, Oct. 2022.
5. *†Goldmann C., Ziegler B., Lyon E.C., ***Hinkle M.A.G.** (2022) “Assessing Manganese Concentrations in Groundwater across the Shenandoah Valley, VA.” Oral presentation by student Goldmann at the Geological Society of America Conference, Denver, Co, Oct. 2022.
6. ***Hinkle M.A.G.**, Rosenfeld C.E., †Teagle S.G., Post J., Santelli C.M. (2022) “Mycogenic Mn oxide structural changes in the presence of Ni allow for increased incorporation over time.” Oral presentation by Hinkle at the Geological Society of America Conference, Denver, CO, Oct. 2022.
7. ***Hinkle M.A.G.**, †Croy M., †Culbertson H., †Goldmann C., †Willis N., †Roquemore M.G., Lyon E.C. (2022) “Identifying the Dominant Controls on Mn Concentrations in Springs and Groundwater Wells Across the Shenandoah Valley, VA USA.” Oral presentation by Hinkle at the international Goldschmidt Conference, Honolulu Hawaii, July 2022.
8. *†Teagle S., †Harrison S.C., †Nguyen G., **Hinkle M.A.G.** (2022) “Improving coal mine drainage remediation methods to more rapidly and effectively remediate manganese with a dual ‘myco-zeo’ system. Oral presentation (selected for a session lightning talk) **and** poster presentation by Teagle at the international Goldschmidt Conference, Honolulu Hawaii, July 2022.
9. *†Teagle S., †Nguyen G., †Harrison S.C., **Hinkle M.A.G.** (2022) “Liner rock geochemistry impacts manganese remediation from coal mine drainage: Toward developing a rapid and long term solution combining fungal oxidative precipitation with zeolite adsorption” Poster presentation by Teagle at the 263rd American Chemical Society National Meeting, March 2022.
10. ***Hinkle M.A.G.**, †Croy A., †Culbertson H., †Goldmann C., †Willis N., †Roquemore M.G., Lyon E. (2022) “Manganese contamination in Shenandoah Valley waters: Exploring the role of aquifer lithology, soil weathering, and manganese ore deposits in mobilizing manganese” Oral presentation by Hinkle at the 263rd American Chemical Society National Meeting, March 2022.
11. †Croy A., †Culbertson H., †Goldmann C., †Willis N., †Roquemore M.G., Lyon E., **Hinkle M.A.G.** (2021) “Assessing manganese concentrations in spring and groundwater across the Shenandoah Valley, VA.” Poster presentation by all students at the 2021 Geological Society of America National Meeting, Oct 2021. doi: 10.1130/abs/2021AM-370401
12. †Larkin K., †Iosso C., Harbor D., **Hinkle M.A.G.**, Lyon E. (2021) “Channel morphology change and legacy sediment mobilization following dam removal on the Maury River, VA” Poster presentation by Larkin at the 2021 Geological Society of America National Meeting, Oct 2021. doi: 10.1130/abs/2021AM-370963
13. †Groff M., †Holicky M.G., †Larkin K., †Pulido M., †Wilde K., **Hinkle M.A.G.**, Lyon E.

“Characterizing land use history and assessing potential geochemical contaminants from legacy sediments and impounded water in Rockbridge County, VA.” Poster presentation by all students at the 2021 Geological Society of America National Meeting, Oct 2021. doi: 10.1130/abs/2021AM-371052

14. †*Peralta J., Santelli C.M., **Hinkle M.A.G.** (2021) “Is there really a “Good” buffer?: Identifying nonreactive pH buffers for fungal manganese oxide research.” Poster presentation by Peralta at the 261st American Chemical Society National Meeting, April 2021.
15. †Roquemore, G., ***Hinkle M.A.G.** (2021) “Identifying Predictive Trends of Manganese Contamination of Groundwater in the Shenandoah Valley, VA.” Poster presentation by Hinkle at the 261st American Chemical Society National Meeting, April 2021.
16. †*Peralta J., Santelli C.M., **Hinkle M.A.G.** (2020) “Is there really a “Good” buffer?: Identifying nonreactive pH buffers for fungal manganese oxide research.” Poster presentation by Peralta at the 259th American Chemical Society National Meeting, Philadelphia, PA, March 2020. (*Conference cancelled due to pandemic*).
17. †*Harrison S.C., **Hinkle M.A.G.** (2020) “Identifying the impacts of liner rock on manganese bioremediation by fungi.” Poster presentation by Harrison at the 259th American Chemical Society National Meeting, Philadelphia, PA, March 2020. (*Conference cancelled due to pandemic*).
18. *Catalano, J.G., Flynn, E.D., **Hinkle M.A.G.** (2020) “Phyllomanganate reduction by organic acids and Mn(II) produce distinct effects on trace metal binding.” Oral presentation by Catalano at the 259th American Chemical Society National Meeting, Philadelphia, PA, March 2020. (*Conference cancelled due to pandemic*).
19. ***Hinkle M.A.G.**, Rosenfeld C.E., Post J.E., Santelli C.M. (2018) “Mycogenic manganese oxide structural changes and nickel incorporation with aging.” Oral presentation by Hinkle at the *28th Goldschmidt Conference*, Boston, MA, Aug 2018.
20. *Catalano J.G., Flynn E.D., **Hinkle M.A.G.** (2018) “Reduction of layered manganese oxide nanoparticles by small organic acids and the impact of trace metal fate.” Invited oral presentation by Catalano at *28th Goldschmidt Conference*, Boston, MA, Aug 2018.
21. *Rosenfeld C.E., **Hinkle M.A.G.**, Santelli C.M. (2018) “Mycogenic biogeochemistry: simultaneous manganese oxidation and selenium reduction in oxic systems.” Oral presentation by Rosenfeld at *28th Goldschmidt Conference*, Boston, MA, Aug 2018.
22. *Santelli C.M., Hinkle M.A.G., Rosenfeld C.E., Ropeke E., Chaput D.(2018) “Biogenic Mn oxide influences on metal(loid) contaminants.” Invited oral presentation by Santelli at the *28th Goldschmidt Conference*, Boston, MA, Aug 2018.
23. ***Hinkle M.A.G.**, Ling F.T., Heaney P., Post J.E. (2018) “Structural variability in manganese oxides produced at a coal mine drainage remediation site.” Oral presentation by Hinkle at the *255th American Chemical Society National Meeting*, New Orleans, LA, March 2018.
24. *Catalano J.G., Flynn E.D., **Hinkle M.A.G.** (2018) “Reduction of layered manganese oxides by organic acids: Effects on mineral structure and trace metal fate. Invited oral

presentation by Catalano at the 255th American Chemical Society National Meeting, New Orleans, LA, March 2018.

25. *Rosenfeld C.E., **Hinkle M.A.G.**, James B.R., Santelli C.M. (2017) "Mycogenic minerals – Impacts of multi-metal systems on fungal mineral production and metal sequestration." Invited oral presentation by Rosenfeld at *the Soil Science Society of America Meeting*, Tampa, FL, Oct 2017
26. *Rosenfeld C., **Hinkle M.A.G.**, James B.R., Santelli C.M. (2017) "Dualing biominerals? Characterizing simultaneously produced fungal biogenic Mn oxides and Se(0). Invited oral presentation by Rosenfeld at the 253rd American Chemical Society National Meeting, San Francisco, CA, April 2017.
27. ***Hinkle M.A.G.**, Santelli C.M., Post J.E. (2015) "Impact of buffers on mycogenic manganese oxide formation." Oral presentation by Hinkle at *The Geological Society of America Annual Meeting*, Baltimore, MD, Nov 2015.
28. *Catalano J.G., **Hinkle M.A.G.** (2015) "Contrasting effects on trace element fate of iron and manganese oxide transformations induced by electron transfer reactions." Invited oral presentation by Catalano at 25th *Goldschmidt Conference*, Prague, Czech Republic, Aug 2015.
29. *Catalano J.G., Becker K.G., Flynn E.D., Friedrich A.J., Gadol H.J., **Hinkle M.A.G.**, Luo, Y. (2014) "Trace element redistribution during iron oxide recrystallization." Invited oral presentation by Catalano at *Telluride Science Research Center Workshop: Biogeochemistry and Redox Transformations of Iron*, Telluride, CO, Aug 2014.
30. *Catalano J.G., Becker K.G., Flynn E.D., Friedrich A.J., Gadol H.J., **Hinkle M.A.G.** (2014) "Trace element partitioning between iron oxides and aqueous solutions: Evidence for recrystallization." Invited oral presentation by Catalano at 24th *Goldschmidt Conference*, Sacramento, CA, June 2014.
31. ***Hinkle M.A.G.**, Catalano J.G. (2013) "Effect of phosphate and sulfate on Fe(II)-catalyzed trace metal incorporation into and release from Fe(III) oxides." Oral presentation at 23rd *Goldschmidt Conference*, Florence, Italy, *Mineralogical Magazine*, 2013, 77(5), 1301.
32. *Catalano J.G., Becker K.G., Friedrich A.J., **Hinkle M.A.G.**, Luo Y., Otemuyiwa B. (2013) "Trace element and contaminant fate during Fe(II)-catalyzed iron oxide surface transformations." Invited oral presentation by Catalano at 23rd *Goldschmidt Conference*, Florence, Italy, *Mineralogical Magazine*, 2013, 77(5), 840.
33. ***Hinkle M.A.G.**, Catalano J.G. "Interactions of phosphate and sulfate with aqueous Fe(II) on Fe(III) oxide surfaces." (2013) Oral presentation at 245th *American Chemical Society Meeting*, New Orleans, LA, April 2013.
34. ***Hinkle M.A.G.**, Catalano J.G. (2012) "Interaction of Fe(II) with phosphate and sulfate on iron oxide surfaces: Implications for interfacial electron transfer." Poster presentation at *Midwest Geobiology Symposium*, St. Louis, MO, Sept 2012.
35. ***Hinkle M.A.G.**, Catalano J.G. (2012) "Interaction of Fe(II) with phosphate and sulfate on iron oxide surfaces: Implications for interfacial electron transfer." Poster presentation 22nd

Goldschmidt Conference, Montreal, QC, *Mineralogical Magazine*, 2012, 76(6), 1845.

36. ***Gray M.A.**, Buckley A.J., Bachman R.E. (2008) "Solution aggregation and complexation in bipyridine platinum(II) dihalide complexes." Poster presentation at 60th *Southeast Regional Meeting of the American Chemical Society*, Nashville, TN, Nov 2008, SERM-914.

Invited Talks

1. ***Hinkle M.A.G.** (2021) "Remediating coal mine drainage: With a little help from my (myco)friends." Invited oral presentation by Hinkle, *Chemistry Department, Virginia Military Institute*, December 2021.
2. ***Hinkle M.A.G.**, Rosenfeld C.E., Ling F.T., Santelli C.M., Heaney P.J., Post J.E. (2021) "Heavy metal uptake by biogenic manganese oxides with structural variability: connecting lessons from coal mine drainage remediation and the laboratory." Invited oral presentation by Hinkle at the 261st *American Chemical Society National Meeting*, April 2021.
3. ***Hinkle M.A.G.**, Rosenfeld C.E., Ling F.T., Santelli C.M., Heaney P.J., Post J.E. (2020) "Heavy metal uptake by biogenic manganese oxides with structural variability: connecting lessons from coal mine drainage remediation and the laboratory." Invited oral presentation by Hinkle at the 259th *American Chemical Society National Meeting*, Philadelphia, PA, March 2020. (*Conference cancelled due to pandemic*).
4. ***Hinkle M.A.G.** (2019) "Nickel retention and potential for long term sequestration in biomineralized manganese oxides." Invited oral presentation by Hinkle to the *Department of Earth & Environmental Science, Temple University*, March 2019.
5. ***Hinkle M.A.G.**, Rosenfeld C.E., Santelli C.M., Post J.E. (2017) "Changes in Ni binding to and uptake by mycogenic Mn oxides with aging." Invited oral presentation by Hinkle at the *Soil Science Society of America Meeting*, Tampa, FL, October 2017.
6. ***Hinkle M.A.G.**, Flynn E.D., Dye K.G., Santelli C.M., Post J.E., Catalano J.G. (2017) "Interfacial reactions during Mn biogeochemical cycling: Impact on Mn oxide structures and reactivities towards trace metals." Invited oral presentation by Hinkle at the 253rd *American Chemical Society National Meeting*, San Francisco, CA, April 2017.
7. ***Hinkle M.A.G.** (2016) "Interfacial reactions during manganese biogeochemical cycling: Impact on mineral transformations and mycogenic manganese oxide formation." Invited oral presentation at the *Department of Geology, University of Maryland Geochemistry Seminar*, April 2016.
8. ***Hinkle M.A.G.** (2015) "Interfacial reactions during Fe and Mn biogeochemical cycling: Impact on mineral transformations and trace element fate." Invited oral presentation at the *Department of Chemistry, Sewanee*, October 2015.
9. ***Hinkle M.A.G.** (2015) "Mineral transformations and trace element repartitioning during Fe and Mn biogeochemical cycling." Invited oral presentation to the Chemical Sciences and Engineering Division at *Argonne National Laboratory*, January 2015.

Home Institution Presentations

1. ***Hinkle M.A.G.**, Staples B., Hess M., Stewart J. "Sustainability in the Syllabus: Connecting Campus Resources to the Curriculum at Washington & Lee." Fall Academy

session for interested Washington & Lee faculty and staff, Fall 2024.

2. ***Hinkle M.A.G.** (2017) "Manganese, metals, & microbes: Biogeochemistry at the oxic/anoxic partition." Oral presentation to the Washington & Lee Geology Alumni during the Geology Alumni Reunion, Sept 2017.
3. ***Hinkle M.A.G.** (2017) "Manganese, metals, & microbes: Biogeochemistry at the oxic/anoxic partition." Oral presentation to the Smithsonian Institution's National Museum of Natural History Natural History Research Experiences, June 2017.
4. ***Hinkle M.A.G.**, Catalano J.G. (2014) "Introducing inquiry based assignments in a STEM course & assessing the efficacy of interventions." Oral presentation to the Washington University in St. Louis's Education Research Group, Feb 2014.
5. ***Hinkle M.A.G.**, Catalano J. G. (2013) "A comparison of assignment design: Enhancing conceptual and scientific knowledge with structured inquiry methods." Poster presentation at *17th Graduate Research Symposium*, Washington University in St. Louis, Feb 2013.

AWARDS, SCHOLARSHIPS, INTERNSHIPS, & FELLOWSHIPS CONFERRED

Peter Buck Postdoctoral Fellowship, Smithsonian Institution, 2015-2017
Washington University STEM Teaching-as-Research Internship, 2012-2014
Carl Tolman Prize (outstanding teaching assistant), E&PS, Washington University, 2013
Goldschmidt Travel Award, Florence, Italy, 2013
Dean's Award for Teaching Excellence for 2012-2013, Washington University, 2013
T.A. Letter of Recognition, E&PS, Washington University, 2012
Goldschmidt Travel Award, Montreal, Quebec, 2012
Wilkins Scholar, Sewanee, 2005-2009
Tennessee Hope Scholar, Sewanee, 2005-2009
Order of the Gownsmen (academic honor society), Sewanee, 2006-2009
I. Croom Beatty Chemistry Research Internship, Sewanee, 2008

EXTERNAL RESEARCH FUNDING

1. **National Science Foundation (NSF)**, Directorate for Geosciences Division of Earth Sciences, Critical Minerals *Collaborative Research: Rare earth element and yttrium extraction by biotic and abiotic hydrous manganese oxides associated with acidic mine drainage*, 2024-2027, with PI Hinkle (W&L; Award Abstract #2341653) and PI Capo and co-PI Stewart (U of Pittsburgh; Award Abstract # 2341652)

\$550,000 total, Hinkle portion: \$180,189.
2. **Virginia Foundation of Independent Colleges (VFIC)**, Mednick Memorial Fellowship, *Assessing Viability of Novel Coal Mine Drainage Passive Bioremediation Methods*, 2021
\$2,000
3. **Keck Geology Consortium**, Advanced Research Project, *Assessing Ground and Surface Water Quality in the Shenandoah Valley, Virginia*, 2021-2022, co-PI with Lyon (W&L)
\$69,264.
4. ***Keck Geology Consortium**, Advanced Research Project, *Identifying major controls on soil and groundwater contamination in the Shenandoah Valley & Southwest Virginia*, 2020-2021, co-PI with Lindquist (Macalester College), ~~\$73,686~~
*cancelled due to COVID-19.

INTERNAL RESEARCH FUNDING

1. Collaborative Faculty-Student Research Grant, Washington & Lee University, 2024, \$1,500.
2. Lenfest Summer Fellowship Award, Washington & Lee University, *Advancing Techniques Using Biomineralizing Fungi for Coal Mine Drainage and Potential PFAS Remediation*, 2024, \$6,496.90.
3. Lenfest Summer Fellowship Award, Washington & Lee University, *Comparing the Efficacy of Coal Mine Drainage Remediation by Synthetic and Mined Zeolites in a Novel "MycoZeo" Passive Bioremediation Method*, 2023, \$5,183.
4. Lenfest Summer Fellowship Award, Washington & Lee University, *Toward Developing a Rapid and Long Term Solution Combining Fungal Oxidative Precipitation with Zeolite Adsorption: A Dual 'Mycozeo'-Bioremediation Process*, 2022, \$6,500.
5. Lenfest Summer Fellowship Award, Washington & Lee University, *Assessing viability of novel coal mine drainage passive bioremediation methods*, 2020, \$5,937.
6. Lenfest Summer Fellowship Award, Washington & Lee University, *Identifying the Impacts of pH Buffers and Liner Rock on Manganese Bioremediation by Fungi*, 2018, \$5,726.

GRANTS APPLIED FOR AND WAITING ON REVIEWS

1. Barber N. (PI), Rahl J. (Co-PI), **Hinkle M.A.G. (Co-PI)** (2024) "EA: Acquisition of a confocal Raman imaging microscope for Washington and Lee University (W&L)" submitted to NSF EAR/IF (instrumentation and facilities) program.

RESEARCH ADVISING ACTIVITIES

W&L Undergraduate Thesis Students

1. Jorge Gomez (W&L C'25) Earth & Environmental Geoscience Thesis (2024-2025)
2. Kylie Therrien (W&L C'25) Earth & Environmental Geoscience Thesis (2024-2025)
Kylie Therrien co-advised with Lisa Greer
3. Ngoc Alicia Nguyen (W&L C'24) Earth & Environmental Geoscience Thesis (2023)
4. Sarah Teagle (W&L C'23) Chemistry Honors Thesis (2021-2023)
5. Haley Culbertson (W&L C'22) Geology Honors Thesis (2021-2022)
6. Marina Ani Croy (W&L C'22) Geology Thesis (2021-2022)
7. Liz Todd (W&L C' 19) ENVS Honors Thesis (2018-2019)

W&L Undergraduate Summer Research (non-thesis) Students

1. Riley Mitchelson (W&L C'28) NSF Summer Student Researcher (Summer 2024)
2. Aden Boyd (W&L C'27) Summer Research Scholar (Summer 2024)
3. Cassandra Loera (W&L C'28) Summer Research Scholar (Summer 2024)
4. Nicolas Angustia (W&L C'29) Advanced Immersion and Mentoring Scholar (Summer 2024)
5. Emma Marvelli (W&L C'28) Summer Research Scholar (Summer 2024)
Emma Marvelli co-advised with Visiting Asst Professor Karena Gill
6. James Edwards (W&L C'25) Summer Research Scholar (Summer 2023 & 2024)
7. Katalyn Denby (W&L C'26) Johnson Opportunity Grant (Summer 2023)
8. Ngoc (Alicia) Nguyen (W&L C'24) Summer Research Scholar (Summer 2022)
9. Ella Dorman (W&L C'24) Summer Research Scholar (Summer 2022)
10. Sarah Grace Teagle (W&L C'23) Summer Research Scholar (Summer 2021)
11. Giang Nguyen (W&L C'24) Summer Research Scholar (Summer 2021)
12. Haley Culbertson (W&L C'22) Johnson Opportunity Grant (Summer 2021)
13. Grace Roquemore (W&L C'21) R. Preston Hawkins IV Geology Award (Summer 2020)

14. Kathryn Hensler (W&L C'21) Summer Research Scholar (Summer 2020)
15. Samantha Armstrong (W&L C'21) Summer Research Scholar (Summer 2020)
16. Phillip Hall (W&L C'21) Environmental Studies Summer Grant (Summer 2020)
17. Sarah Cate Harrison (W&L C'19) Summer Research Scholar (Summer 2018)
18. Javier Peralta (W&L C'21) Summer Research Scholar (Summer 2018)
19. Sam Womack (W&L C'21) Chesapeake Bay Internship (Summer 2018)
Sam Womack co-advised with Robert Humston
20. Briyana Mondesir (W&L C'22) Advanced Research Consortium Student (Summer 2018)

W&L Undergraduate Independent Study Students (During Academic Year)

1. James Edwards (W&L C'25) Directed Independent Study (Fall 2023, Fall 2024)
2. Riley Mitchelson (W&L C'28) Directed Independent Study (Fall 2024)
3. Emma Marvelli (W&L C'28) Directed Independent Study (Fall 2024)
4. Ngoc (Alicia) Nguyen (W&L C'24) Directed Independent Study (Fall 2022-Winter 2023)
5. Haley Culbertson (W&L C'22) Directed Independent Study (Spring 2021)
6. Grace Roquemore (W&L C'21) Directed Independent Study (Fall 2020-Winter 2021)
7. Chris Messerich (W&L C'20) Geology Independent Study (2020)
8. Kurt Waibel (W&L C'19) Geology Independent Study (Fall 2018-Winter 2019)

Non-W&L Undergraduate Thesis / Capstone Students

1. Chris Goldmann (C'22), Trinity
2. Noah Willis (C'22), Whitman
3. Kallan Wilde (C'22), St. Norbert's College
4. Maddie Holicky (C'22), Beloit
5. Martina Pulido (C'22), Beloit
6. Mia Groff (C'22), Whitman

Postdoctoral Fellows*

1. Madhumita Chakraborty, 2022-2024

**note: Washington and Lee is an undergraduate-only institution, and thus no graduate students are included on this list. However, our department recently began a postdoctoral fellowship program. Dr. Madhumita Chakraborty is the first to join our department.*

TEACHING EXPERIENCE

Washington and Lee University, Assistant Professor, Fall 2017-Present

Courses Taught

- Sustainable Earth (GEOL 102)
4 credits (class + lab), Fulfills science lab foundation and distribution requirement
Taught Winter 2024, Fall 2022
- Earth & Environmental Geochemistry (GEOL 311)
4 credits (teach class + lab), Cross-listed with ENVS
Taught Fall 2023, Winter 2022, Winter 2021, Fall 2018
- Water Resources (GEOL 150)
3 credits (teach class), Cross-listed with ENVS, Fulfills additional science course foundation and distribution requirement
Taught Fall 2021, Winter 2019, Winter 2018
- Hydrology (GEOL 240)
4 credits (teach integrated class + lab), Cross-listed with ENVS
Taught Fall 2021, Winter 2020, Winter 2019, Fall 2017
- Environmental Field Methods (GEOL 231)
4 credits (teach integrated class + lab), Cross-listed with ENVS

- Taught Spring 2023, Spring 2021, Spring 2019
 Earth Lab: Dam It?! An Environmental Exploration of Dams (GEOL 105)
 4 credits (class + lab), Cross-listed with ENV5
 Taught Spring 2020
 General Geology (Now 'Dynamic Earth: Introductory Geology') (GEOL 101)
 4 credits (class + lab), Fulfills science lab foundation and distribution requirement
 Taught Winter 2018

Washington University in St. Louis, Graduate Student, 2010-2015

Teaching Assistantships

1. EPSc 444 Environmental Geochemistry, Fall 2012 (class)
2. EPSc 201 Earth & Environment (Introduction to Geology), Fall 2011 (class + lab)
3. EPSc 108 Oceans & the Atmosphere, Fall 2010 (class)

Teacher Training Activities

1. National Center for Faculty Development & Diversity Program (and alumni program).
2018-current.
2. Safe Zone Ally Training, Washington & Lee University, *2021.*
3. STEM Teaching-As-Research (WU-STAR) Intern, *2012-2014.*
4. Mentor and research advisor to high school student conducting research in the Catalano Aqueous Geochemistry Lab, Students & Teachers as Research Scientists (STARS),
Summer 2012.

ACADEMIC SERVICE

Service to the University

1. Faculty Handbook Revision Committee, elected position, W&L, *2024-current.*
2. Faculty Athletic Mentor, Riding, W&L, *2024-current.*
3. Advanced Immersion & Mentoring Advisor *Summer 2024* (research) – *current* (advising)
4. Chair of Subcommittee on Faculty Engagement, University Sustainability Committee,
W&L, *2023-current.*
5. University Sustainability Committee Member, W&L, *2023-current.*
6. Harte Center for Teaching and Learning Advisory Board, W&L, *2021 – 2023.*
7. Fellowships Committee Member, 1 year replacement, W&L, *2021 – 2022.*
8. Women in Math and Science (WiMS) Teacher Scholars Cohort co-organizer, W&L, *2018 – 2020, and 2021-2022. (WiMS went on hiatus in 2020 due to the pandemic).*
9. New Faculty Orientation Panel on Setting the Tone: Creating a Strong Start in Your Classes, W&L, *2021.*
10. Virginia Foundation for Independent Colleges (VFIC) Collaborative Research Project member as the W&L representative, *2019 – 2020.*
11. Outdoor Classroom Development Project Advisor, W&L, *2019.*
12. Exploring NCFDD Strategies for Productivity & Work-Life Balance Teacher Scholars Cohort co-organizer, W&L, *2018 – 2019.*
13. Virginia Foundation for Independent Colleges (VFIC) STEM Initiative W&L Team Member (attending & participating in 3 out of town STEM pedagogy workshops), *2018 – 2020.*
14. Advanced Research Cohort Advisor & Mentor *Summer 2018* (research) – *2019* (advising)
15. Foundational Distribution Requirement assessment pilot project member, *2018.*

Service to the Earth & Environmental Geoscience Department

1. Tenure Track Assistant Professor search committee, *2024.*
2. EEG New Faculty Mentor, *2023-2024.*
3. EEG Portfolio Development Literature Review, Proposal Draft, Syllabus Draft, *2023-2024.*
4. Visiting Assistant Professor (general geoscience) search committee, *2023.*

5. Postdoctoral Fellow search committee, 2023.
6. Tenure Track Assistant Professor search committee, 2022.
7. Postdoctoral Fellow search committee, 2022.
8. Visiting Assistant Professor (general geoscience) search committee, 2022.
9. Unlearning Racism in the Geosciences (URGE) W&L Geology Department Pod Member, 2020-2021.
10. Department representative for the Assurance of Learning Committee's Science Lab initiative, 2020-2021.
11. Committee member developing a new introductory environmental geoscience course GEOL 102: Sustainable Earth, 2019-2020.
12. Visiting Assistant Professor (general geoscience) search committee, 2019-2020.
13. Visiting Assistant Professor (geomorphology) search committee, 2019-2020.

Service to the ENVS Program

1. ENVS Capstone Course Science Co-Instructor, 2024-current. Assisting in the teaching of the EVS Capstone Course by attending class sessions, making office hours and outside hours available to help assist ENVS students in developing and executing their capstones, particularly those interested in science.
2. Subcommittee member developing ENVS thematic tracks, 2018-2019.
3. Advisor to ENVS student E.C. Myers (W&L C'20) Senior Capstone Project (2019-2020).
4. Advisor to ENVS student Anna Soroka (W&L C'20) Senior Capstone Project (2019-2020).
5. Advisor to ENVS students Sarah Cate Harrison, Kurt Waibel, and Will Rowson's Senior Capstone Group Project (2018-2019).

SCIENTIFIC COMMUNITY OUTREACH

1. Scientific advisor for Rockbridge Area Conservation Council's PFAS Working Group, 2022-current.
2. Volunteer teacher for soil science, Harrington Waddell Elementary School, 2024.
3. Boxerwood's Annual High School Green Career Expo Presenter, 2023.
4. Scientific advisor, water quality analyzer, recruiter and trainer for W&L students conducting field work in support of the Natural Bridge Soil & Water Conservation District's spring study of Rockbridge County, VA, 2019 - 2022.
5. Volunteer, Waddell Science Club, 2019.
6. Peer Mentor, Earth & Planetary Sciences, Washington University in St. Louis, 2012-2014.
7. Student Mentor, Students & Teachers as Research Scientists (STARS), Summer 2012.
8. Guest Lecturer at Nerinx Hall High School, St. Louis, holding afternoon lectures and Q&A sessions on Earth and Planetary Sciences, 2011.
9. Activity Leader, Association for Women in Science (AWIS), 2010 & 2011.

GENERAL COMMUNITY OUTREACH

1. Coach, Rockbridge Area Recreation Organization, Rookie Basketball, 2023-2024 season.
2. Maury River Friends Meeting Outreach Committee, 2021-2024.
3. Asst. Coach, Rockbridge Area Recreation Organization, Cal Ripken Baseball, 2022.
4. Volunteer, Woods Creek Montessori, 2019-2020.
5. Member and Fiber Provider through the Shave 'Em to Save 'Em Program, Livestock Conservancy, 2018-current.

PROFESSIONAL SERVICE AND ACTIVITIES

Professional Society Memberships

Omicron Delta Kappa National Leadership Honor Society
 National Association of Geoscience Teachers
 Mineralogical Society of America

The Geochemical Society
Soil Science Society of America
American Chemical Society
International X-ray Absorption Society
Geological Society of America
Earth Science Women's Network
Virginia Water Faculty
Society for Environmental Geochemistry and Health
Association for the Advancement of Sustainability in Higher Education

Reviewer for Scholarly Journals and Awards

Environmental Science & Technology, Geochimica et Cosmochimica Acta, American Mineralogist, Chemical Geology, Journal of Geochemical Exploration, Geochemistry, NSF Mid Career Awards, Stanford Synchrotron Radiation Lightsource Beamtime Proposals

INSTRUMENTATION EXPERIENCE

XAFS spectroscopy, ATR-FTIR spectroscopy, ICP-OES, IC, XRD, NMR spectroscopy, UV-vis spectroscopy, BET analysis, SEM / EDS.

SOFTWARE PROFICIENCY

MatLab, Geochemist's Workbench, ArcGIS, SixPack, FEFF, Ifeffit—Athena, Hephaestus, ATOMS