

# Dr. Justin Byron Richardson

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## RESEARCH FOCI

- Biogeochemistry of metals and metalloids in the plant-soil-mineral system.
- Application of toxic metal sequestration and nutrient management to human, plants, and animals.

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## PROFESSIONAL EXPERIENCE

2023–Present **UNIVERSITY OF VIRGINIA** Charlottesville, VA  
*Assistant Professor*  
Department of Environmental Science

2018 – 2023 **UNIVERSITY OF MASSACHUSETTS AMHERST** Amherst, MA  
*Assistant Professor*  
Department of Earth, Geographic, and Climate Sciences

2015 – 2017 **CORNELL UNIVERSITY** Ithaca, NY  
*Critical Zone Observatory National Office Postdoctoral Fellow*  
Dept. of Earth and Atm. Sci. – Dr. Louis A. Derry  
Dept of Geosciences – Dr. Timothy White at Pennsylvania State University

2011 – 2015 **DARTMOUTH COLLEGE** Hanover, NH  
*Graduate Student*  
Dept. of Earth Sciences - PhD Advisor: Dr. Andrew J. Friedland

2009 – 2011 **UNIVERSITY OF CALIFORNIA RIVERSIDE** Riverside, CA  
*Undergraduate researcher*  
Dept. of Botany and Plant Sciences – Adviser – Dr. G. Darrel Jenerette

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## EDUCATION

2011 - 2015 **DARTMOUTH COLLEGE** Hanover, NH  
Doctorate of Philosophy of Earth Sciences, June 2015  
Thesis: *Anthropogenic Changes to Mercury and Lead Biogeochemistry in Forest Soils across the Northeastern US*

2007 - 2010 **UNIVERSITY OF CALIFORNIA, RIVERSIDE** Riverside, California  
Bachelor of Science, June 2010  
Major: Environmental Science: Soil Science, minor: Botany and Plant Sciences

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## RESEARCH PUBLICATION SUMMARY STATISTICS:

Total peer-reviewed papers: 58                      Published since joining UVA: 9  
Published first-authored studies: 31              Publications led by undergraduate mentees: 9  
Publications led by graduate student mentees: 6  
Total citation count: 1076 (google scholar)      h-index: 17      i10-index: 29

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## PUBLICATIONS IN PREPARATION OR REVIEW

(\*\*\*) INDICATES UNDERGRADUATE OR (\*\*) GRADUATE MENTEE AUTHOR/PRESENTER

*In prep*              Richardson JB, Rice AM\*\*, D'Amato AW, Smith GA, Perdrial N. Nutrient sourcing with managed northern hardwoods along a soil nutrient gradient – evidence from calcium and magnesium stable isotopes *To be submitted to Biogeochemistry*

- In prep* Perdrial N., Walser SL., Sirkovich EC., Richardson JB., Cope M. Soil Lead Risks Associated with Urbanization History in Springfield MA and Hartford CT USA. *To be Submitted to GeoHealth*
- In review* Rice AM\*\*, D'Amato AW, Smith GA, Perdrial N, Richardson JB. Soil nutrient gradients shape biomass allocation and merchantable wood in actively managed New England forests *Submitted to Journal of Forestry Research*
- In review* Justin B. Richardson, Owen C. Porterfield\*\*\*, Andrew W. Schroth, Andrew J. Friedland, James M. Kaste. Lead pollution mobility in forest soils of the Northeastern United States evaluated with a 40-year resampling study. *Submitted to Water, Air, & Soil Pollution*
- In review* Ackerman AM\*\*, Copenheaver CA, Richardson JB, Limaye AB. Effects of Debris Flow Disturbance on Vegetation, Soils, and Topography in a Steep Landscape in Central Virginia. *Submitted to Journal of Geophysical Research: Biogeosciences*
- Revising* Kohlhaas RT.\*\*\*, Schroeder SE.\*\*\*, Richardson JB, Dobson AM. Effects of climate, nutritional-role, or soil properties governing element pools and residence times in temperate deciduous forests across the northeastern US. *Submitted to Environmental Science and Pollution Research*
- Revising* Richardson JB, Dobson AM. Effects of climate, nutritional-role, or soil properties governing element pools and residence times in temperate deciduous forests across the northeastern US. *Submitted to Plant and Soil*

#### PEER-REVIEWED PUBLICATIONS

(\*\*\*) INDICATES UNDERGRADUATE OR (\*\*) GRADUATE MENTEE AUTHOR/PRESENTER

- 2025 Richardson JB, Dobson AM. Effects of Rooting, Temperature, and Organic Horizon Development on Temperate Forest Soil Carbon, Nitrogen, and Inorganic Nutrients in Transplanted Soils. *Biogeochemistry*168:75 <https://doi.org/10.1007/s10533-025-01266-z>
- 2025 Richardson JB, Sirkovich EC\*\*\*, Vukicevich E. Nutrient and Trace Elements in Suburban Sugar Maple (*Acer saccharum*) Sap, Syrup, and Soils from Massachusetts, Connecticut, New Jersey, and Pennsylvania. *Bulletin of Environmental Contamination* 114(5):78
- 2024 Richardson JB. Basalt rock dust on soil health properties and inorganic nutrients – laboratory and field study at two organic farm soils in New England, USA. *Agriculture* 15(1), 52; <https://doi.org/10.3390/agriculture15010052>
- 2024 Richter DD, Billings SA, Brantley SL, Gaillardet J., Markewitz D., Schlesinger WH., Amundson R., Ashley GM.,... Richardson JB.... Marilyn Wolf. Earth Sciences Are the Model Sciences of the Anthropocene Perspectives of Earth and Space Scientists. 5, e2024CN000237
- 2024 Rice AM\*\*, Perdrial N, Treto V, D'Amato AW, Smith GA, Richardson JB. Influence of parent material mineralogy on forest soil nutrient release rates across a nutrient richness gradient *Geoderma* 451, 117081
- 2024 Richardson JB, Truong MT\*\*, Dobson AM. Throughfall and Litterfall Fluxes Reveal New Inputs and Foliar Cycling Maintain Pb, Cd, Cu, and Zn Pollution Legacy in Eastern US Temperate Forests. *Pollutants* 4 (4), 474-489
- 2024 Teng W\*\*, Yu Q., Mischenko I\*\*\*, Rice AM\*\*, Richardson JB. Predicting foliar nutrient concentrations across geologic materials and tree genera in the northeastern United States using spectral reflectance and PLSR models. *Journal of Remote Sensing* 4, 0093.
- 2024 Buck A\*\*\*, Zarrella-Smith K\*\*, Jordaan A, Richardson JB, Trace elements in European oyster (*Ostrea edulis*), seawater, and sediments in Boston Harbor, Massachusetts, USA - implications for biomonitoring and ecotoxicology. *Bulletin of Environmental Contamination and Toxicology* 112 (1), 20

2024 Hanley ML<sup>\*\*\*</sup>, Vukicevich E, Rice AM<sup>\*\*</sup>, Richardson JB, Uptake of Toxic and Nutrient Elements by Foraged Edible and Medicinal Mushrooms Throughout Connecticut River Valley, New England, USA. *Environmental Science and Pollution Research*, 31 (4), 5526-5539

Published studies at University of Massachusetts Amherst

- 2023 Avkopashvili G., Gongadze A., Richardson J., Gakhokidze R., Osidze I., Asanidze L., Bioaccumulation of Macro and Micro Elements by the *Amaranthus Viridis* from the Cadmium-Contaminated Soil. *Bulletin of the Georgian National Academy of Sciences* 17:3
- 2023 Wania Imran<sup>\*\*\*</sup>, Richardson JB, Trace element (As, Cd, Cr, Cu, Pb, U, Se) concentrations and health hazards from drinking water and market rice across Lahore city, Pakistan. *Sustainability* 15(18), p.13463.
- 2023 Sirkovich EC<sup>\*\*\*</sup>, Walser SL<sup>\*\*</sup>, Richardson JB, Perdrial N. Evaluating Trace Elements in Urban Forest Soils across Three Contrasting New England USA Towns and Cities by pXRF and Mass Spectrometry. *Environmental Pollution*, 336, p.122441.
- 2023 Richardson JB, Thrasher SA<sup>\*\*\*</sup>, Saccardi B<sup>\*\*</sup>, Clark EV. Sulfidic schist release of As, Cu, and Pb in laboratory experiments and across eleven watersheds in central Massachusetts, USA. *Environmental Geochemistry and Health* 1-19.  
<https://doi.org/10.1007/s10653-023-01718-1>
- 2023 Street BB<sup>\*\*\*</sup>, Rice AM<sup>\*\*</sup>, Richardson JB. Forest Floor and Na azide effect on elements in leachate from contrasting New Hampshire and Virginia forest soils. *Soil Science Society of America Journal* 87, no. 6 (2023): 1444-1457.
- 2023 Butler MJ<sup>\*\*\*</sup>, Yellen BC, Oyewumi O., Richardson JB “Accumulation and transport of nutrient and pollutant elements in riparian soils, sediments, and river waters across the Thames River Watershed, Connecticut, USA” *Science of the Total Environment* 165630.  
DOI: 10.1016/j.scitotenv.2023.165630
- 2023 Richardson JB, Linking soil to river water export of nutrient and oxyhydroxide forming elements across land-uses in the Deerfield River, Massachusetts, USA. *CATENA* 228, 107174. <https://doi.org/10.1016/j.catena.2023.107174>
- 2023 Bowdish L<sup>\*\*\*</sup>, Duran A., Richardson JB., Vukicevich E., Mycorrhizal fungi and soil factors influence toxic element uptake in urban grown produce. *Urban Agriculture & Regional Food Systems* 8(1), p.e20037 <https://doi.org/10.1002/uar2.20037>
- 2022 Walser SL<sup>\*\*\*</sup>, Sirkovich EC<sup>\*\*\*</sup>, Richardson JB, McStay AE<sup>\*\*\*</sup>, Perdrial NJ. Moisture, organic matter, and large particle correction for accurate Pb portable X-ray fluorescence assessment in urban soils. *X-Ray Spectrometry* 52(2):72-82 1-11 DOI: 10.1002/xrs.3321
- 2022 McStay AE<sup>\*\*\*</sup>, Walser SL<sup>\*\*\*</sup>, Sirkovich EC<sup>\*\*\*</sup>, Perdrial NJ, Richardson JB. Macronutrients micronutrients, and toxic elements in soils measured by pXRF and ICP-based methods and assessment of plant tissue concentrations across ten urban community garden soils. *Journal of Environmental Quality* Vol. 51, No. 3, pp. 439-450
- 2022 Richardson JB, Johnston MR, Herrick BM. Accumulation of macronutrients (Ca, Mg, P, K) in forest and laboratory soils following invasion by *Amyntas tokioensis* and *Amyntas agrestis*. *Pedobiologia*. 91, p.15080
- 2022 Baranes H.E.<sup>\*\*</sup>, Woodruff J.D., Geyer W.R., Yellen B.C., Richardson J.B. Sources, Mechanisms, and Timescales of Sediment Delivery to a New England Salt Marsh. *Journal of Geophysical Research: Earth Surface* 127(3), p.e2021JF006478.
- 2022 Richardson JB, Mischenko IC<sup>\*\*\*</sup>, Butler MJ<sup>\*\*\*</sup>. Mercury in forest soils and suspended sediments in the Connecticut River, Merrimack River, and Thames River watersheds of the northeastern USA. *Pollutants* 2(2), pp.252-268

- 2022 Richardson JB, Mischenko IC<sup>\*\*\*</sup>, Mackowiak TJ<sup>\*\*\*</sup>, Perdrial N. Release of trace metals and metalloids from gray shale weathering profiles along a climate gradient and in laboratory incubations – with emphasis on Ga/Al ratios. *Geoderma* 405, 115431
- 2021 Richardson JB, Chase JK<sup>\*\*\*</sup>, Transfer of major nutrients, micronutrient, and toxic elements from soil to grapes to white wines in uncontaminated vineyards. *International Journal of Environmental Research and Public Health* 18(24), 13271
- 2021 Richardson JB. Shale weathering profiles show Hg sequestration along a New York-Tennessee climate gradient. *Environmental Geochemistry and Health* 44(10), 3515-3526
- 2021 Brantley SL, Wen T., Agarwal D., Catalano, J.G., Schroeder, P.A., Lehnert, K., Varadharajan, C., Pett-Ridge, J., Engle, M., Castronova, A.M. Hooper, R.P., Ma X., Jin, L., McHenry K., Aronson E., Shaughnessy AR., Derry LA., Richardson JB., Bales J., Piece EM., The future low-temperature geochemical data-scape as envisioned by the US geochemical community. *Computers & Geosciences* 157:104933
- 2021 Chang, C.H., Bartz, M.L., Brown, G., Callaham, M.A., Cameron, E.K., Dávalos, A., Dobson, A., Görres, J.H., Herrick, B.M., Ikeda, H. James, S.W. Johnston MR, McCay TS, McHugh Damhnait, Minamiya Y., Nouri-Aiin, M., Novo M., Ortiz-Pachar J., Pinder RA., Ransom T., Richardson J.B., Snyder, B.A. Szlavecz K., 2021. The second wave of earthworm invasions in North America: biology, environmental impacts, management and control of invasive jumping worms. *Biological Invasions*, pp.1-32.
- 2021 Richardson JB, Zuñiga LX<sup>\*\*</sup>. Quantifying aluminosilicate manganese release and dissolution rates across organic ligand treatments from rocks, minerals, and soils. *Acta Geochimica*. 40, 484–497
- 2021 Peach M.E<sup>\*\*</sup>., Richardson J.B., Friedland, A.J., Legacies of Nutrient Retention and Loss in Residential Ecosystems. *Ecosystems* 24, 1891–1905.  
<https://doi.org/10.1007/s10021-021-00623-x>
- 2021 Mackowiak TJ<sup>\*\*\*</sup>, Mischenko IC<sup>\*\*\*</sup>, Butler MJ<sup>\*\*\*</sup>, Richardson JB. Accumulation of Trace Metals in Soils and Foliage across Lithologies, Ecosystems, and Development Intensities in Southern California. *Journal of Soils and Sediments* 21(4), 1713-1729  
DOI 10.1007/s11368-021-02893-3
- 2021 Richardson JB. Comparing trace element (As, Cu, Ni, Pb, Zn) soil-surface water linkages in montane, upland watersheds with lowland, urban watersheds in New England, USA. *Water* 13(1), 59; <https://doi.org/10.3390/w13010059>
- 2020 Timothy S. McCay, George Brown, Mac A. Callaham, Jr., Chih-Han Chang, Andrea Dávalos, Annise Dobson, Josef H. Görres, Bradley M. Herrick, Samuel W. James, Marie R. Johnston, Damhnait McHugh, Tanya Minter, Jean-David Moore, Maryam Nouri-Aiin, Marta Novo, Jaime Ortiz-Pachar, Rebecca A. Pinder, Justin B. Richardson, Bruce A. Snyder, Katalin Szlavecz. Tools for Monitoring and Study of Peregrine Pheretimid Earthworms (Megascolecidae) *Pedobiologia* 83, p.150669.
- 2020 Sizmur T., Richardson J.B., “Earthworms accelerate the biogeochemical cycling of potentially toxic elements: Results of a meta-analysis”. *Soil Biology and Biochemistry* 148, p.107865
- 2020 Richardson J.B., “Do urban forests show trace metal or rare earth element enrichment from waste incinerators? A three-city case study in the northeastern USA. *Environmental Science and Pollution Research* 27(17):21790-21803
- 2020 Richardson J.B., Görres J.H., Sizmur T., “Synthesis of earthworm trace metal uptake and bioaccumulation data: patterns, experimental artifacts, and research needs”. *Environmental Pollution* 114126.
- 2020 Mistikawy J.A<sup>\*\*</sup>., Mackowiak T. <sup>\*\*\*</sup>, Butler M.J. <sup>\*\*\*</sup>, Mischenko I.C. <sup>\*\*\*</sup>, Cernack R.S., Richardson J.B. "Chromium, Manganese, Nickel, and Cobalt mobility and bioavailability from

- mafic-to-ultramafic mine spoil weathering in western Massachusetts, USA". *Environmental Geochemistry and Health* 42(10), pp.3263-3279
- 2020 Richardson J.B., Moore L.S.\*\*\*, "A tale of three cities: mercury in urban deciduous trees and soils across land-uses in Poughkeepsie NY, Hartford CT, and Springfield MA USA". *Science of the Total Environment* 136869.
- 2020 Marek R.S.\*\*\*, Richardson J.B., "Investigating surficial geologic controls on soil properties and inorganic nutrient uptake in Western Massachusetts, USA". *Journal of Soil Science and Plant Nutrition* 20:901–911
- 2019 Dobson A.M., Richardson J.B., Blossey B., "Effects of earthworms and white-tailed deer on roots, arbuscular mycorrhizae and forest seedling performance" *Ecology* e02903.
- 2019 Jordan J.D.\*\*\*, Cernak R., Richardson J.B. "Exploring the role of soil geochemistry on Mn and Mn/Ca uptake on 75-year-old mine spoils in western Massachusetts, USA" *Environmental Geochemistry and Health*. 41 (6), 2763-2775
- 2019 Richardson J.B., "Trace elements in surface soils and Megascolecidae earthworms in urban forests adjacent to four land-uses around Poughkeepsie, New York, USA". *Bulletin of Environmental Contamination and Toxicology* 103 (3), 385-390.

Published studies during doctorate degree and postdoctoral position

- 2018 Richardson J.B., King E.K., Regolith weathering and sorption influences molybdenum, vanadium, and chromium export via stream water at four granitoid Critical Zone Observatories. *Frontiers in Earth Science* 193:1–15  
DOI: 10.3389/feart.2018.00193
- 2018 Richardson J.B., Aguirre A.A., Buss H.L., O'Geen A.T., Gu X., Rempe D.M., Richter D.D., Mercury sourcing and sequestration in weathering profiles at six Critical Zone Observatories across North America. *Global Biogeochemical Cycles* 32:1542-1555. DOI: 10.1029/2018GB005974
- 2018 Richardson J.B., Bernd, B., Dobson A.M., Earthworm impacts on trace metal (Al, Fe, Mo, Cu, Zn, Pb) exchangeability and uptake by young *Acer saccharum* and *Polystichum acrostichoides*. *Biogeochemistry* 138:103–119.
- 2017 Richardson J.B., Petrenko, C.L., Friedland A.J. Mercury along three clear-cut forest soils chronosequences in the northeastern U.S. *Environmental Science and Pollution Research*  
DOI: 10.1007/s11356-017-0356-9
- 2017 Dobson A.M., Richardson J.B., Bernd, B. Invasive earthworms change nutrient availability and uptake by forest understory plants. *Plant and Soil*. 421, 175-190  
DOI: 10.1007/s11104-017-3412-9
- 2017 Richardson J.B., Görres J.H., Friedland A.J., Exotic earthworms decrease Cd, Hg, and Pb pools in upland forest soils of Vermont and New Hampshire USA. *Bulletin of Environmental Contamination and Toxicology* 99(4), 428-432.  
DOI: 10.1007/s00128-017-2170-y
- 2017 Richardson J.B., Petrenko, C.L., Friedland A.J. Base cation and micronutrient pools along three clear-cut forest soils chronosequences in the northeastern U.S. *Nutrient Cycling in Agroecosystem* 109:161-179.  
DOI:10.1007/s10705-017-9876-4
- 2017 Richardson J.B. Manganese and Mn/Ca ratios in soil and vegetation forests across the northeastern US: insights on spatial Mn enrichment. *Science of the Total Environment* 581:612-620.  
DOI:10.1016/j.scitotenv.2016.12.170

- 2016 Richardson J.B., Renock D.J., Görres J.H., Jackson B.P., Webb S.M., Friedland A.J. Nutrient and pollutant metals within earthworm residues are immobilized in soil during decomposition. *Soil Biology and Biochemistry* 101:217-225.
- 2016 Richardson, J.B., Görres J.H., Friedland A.J., Forest floor decomposition, metal exchangeability, and metal bioaccumulation by *Amyntas agrestis* and *Lumbricus rubellus*. *Environmental Science and Pollution Research*. 1-14 DOI: 10.1007/s11356-016-6994-5
- 2016 Richardson, J.B. Friedland A.J. 2016 Influence of coniferous and deciduous vegetation on major and trace metals in forests of northern New England, USA. *Plant and Soil* 1 – 16 DOI 10.1007/s11104-016-2805-5
- 2015 Richardson J.B., Friedland A.J. Mercury in Coniferous and Deciduous Forests in Northern New England, USA: Implications for Climate Change *Biogeosciences* 12, 6737-6749 DOI:10.5194/bg-12-6737-2015
- 2015 Richardson, J.B., Görres J.H., Friedland, A.J., Jackson B.P. Trace Metals and Metalloids in Forest Soils and Invasive Earthworms in Northern New England, USA. *Soil Biology and Biochemistry* 46:89-95 DOI: 10.1016/j.soilbio.2011.11.008
- 2015 Richardson J.B., Donaldson E.C., Friedland A.J. Response of forest soils lead, copper and zinc to decreasing emissions in the northeastern United States: a synthesis. *Science of the Total Environment* 505:851-859. DOI:10.1016/j.scitotenv.2014.10.023
- 2014 Richardson, J.B., Friedland, A.J., Kaste J.M., Jackson B.P. Forest floor lead changes from 1980 to 2011 and subsequent accumulation in the mineral soil across the northeastern United States. *Journal of Environmental Quality* 43:926-935 DOI:10.2134/jeq2013.10.0435
- 2013 Richardson, J.B., Friedland, A.J., Engerbretson T.R., Kaste J.M., Jackson B.P. Spatial and vertical distribution of mercury in upland forest soils across the northeastern United States. *Environmental Pollution* 182:127-134 DOI: 10.1016/j.envpol.2013.07.01
- 2012 Richardson J.B., Chatterjee A., Jenerette G.D. Optimum temperatures for soil respiration along a semi-arid elevation gradient in southern California. *Soil Biology and Biochemistry* 46:89-95 DOI: 10.1016/j.soilbio.2011.11.008

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#### NON-REFERRED PUBLICATIONS

- 2022 Jelinski N.A., Richardson J.B., Nater E.A., “Soils of humid cool temperate regions” *Encyclopedia of Soils in the Environment*. 2<sup>nd</sup> Edition. Edited by B. Xing and S. Staunton.
- 2022 Richardson J.B. Perdrial NJ, Vautour B. “Portable X-Ray Fluorescence (pXRF) for Rapid Assessment of Toxic and Nutrient Metals in Soils” USDA-NRCS Technology Focus Team
- 2022 Richardson J.B. “Alkaline Earth Metals in Soil” *Encyclopedia of Soils in the Environment*. 2<sup>nd</sup> Edition. Edited by B. Xing and S. Staunton.
- 2019 Richardson J.B. Mistikawy, J.A. “Cobble Mountain Reservoir Chromium Quantification and Mobility Assessment”. Prepared for the Springfield MA Sewer and Water Commission.
- 2017 Richardson J.B. “Critical Zone” definition. *Encyclopedia of Geochemistry*. Part of the series *Encyclopedia of Earth Sciences Series* pp 1-5 DOI: 10.1007/978-3-319-39193-9\_355-1
- 2017 Richardson J.B., Smith L.M. Investigating Your Critical Zone – Applying the Scientific Method to Critical zone Science for Students.

- 2016 – 2018 Richardson J.B., and many others contributors. Adventures in the Critical Blog – the blog of the Critical Zone Observatory National Office.  
<http://CriticalZone.org/national/blogs/>
- 2013 Richardson J.B. Studying Soil Science at an Ivy League School. Soil Horizons. DOI: 10.2136/sh2013-54-5-rc
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#### **RESEARCH SUPPORT SINCE JOINING UVA**

- 2024 - 2025 Robert Wood Johnson Foundation: Combatting misinformation and improving decision making toward environmental health justice, centering regions experiencing airborne coal dust PI: Dr. Sally Pusede, Co-I's: Justin B. Richardson, Kimberly Fields, Liana Richardson, Rachel O'Brien (\$654,205) (\$103,891 to Co-I Justin Richardson)
- 2025 Environmental Institute – University of Virginia. "Evaluating rock dust as an agro-mineral amendment for soil carbon capture in loblolly and soybean agroecosystems" (\$30,000).

#### Submitted major grants since joining UVA:

USDA-National Institute for Food and Agriculture - Agriculture and Food Research Initiative "Evaluating agro-mineral amendment effects on physical, chemical, and biological soil health indicators and corn and soybean nutrition" 2024 - 2027 \$748,847 – Ranked 'Highly Competitive' but not funded due to limited funds.

National Science Foundation Proposal # 2430456 Collaborative Research Proposal: Forest Resilience to Cu and Zn Pollution: advancing elemental ratio and stable isotope tools. \$291,361 – Ranked 'Not Competitive'.

USDA, NRCS: 2024 SPSD Collaborative Soil Survey Research: Afforestation and Climate Controls on Dynamic Soil Properties across Central Appalachians, Piedmont, and Coastal Forest Soils. \$382,831 Ranked 'Highly Competitive' but not funded.

Southern Agricultural Research and Education Proposals: Stabilizing phosphate and inorganic nutrients in vermicomposted bedded pack barn materials and field pastures in Shenandoah Valley Dairy farms. \$371,000 – Ranked 'Not Competitive'.

Defense Advanced Research Projects Agency-EA-25-01: eX Virentia Proposal: Developing the GRAAS Process Through Experimentation. \$566,396 to Co-PI Justin Richardson. Not funded following first round of reviews.

#### Research support concluded before joining UVA

- 2022 – 2024 National Science Foundation - "Does synergy among litter, organic horizons, and roots bolster nutrient retention and production?". Justin B Richardson, Ashley D Keiser, Annise Dobson (\$74,660)
- 2021 – 2024 United States Department of Agriculture – National Institute for Food and Agriculture "Assessing Nutrient Sustainability in Forest Management: Novel Applications of Metal Isotopes and In-Situ Mineral Measurements". PI Justin B Richardson, Co-PIs Nicolas JP Perdrial, Anthony D'Amato UVM (\$470,835)
- 2020 – 2022 United States Department of Agriculture - Natural Resources Conservation Service "Regional Scaling of Blue Carbon Measurements with Lidar-Derived Geomorphic Tools". PI Brian Yellen, Konstantinos Andreadis, Justin B Richardson, Jonathan Woodruff. (\$289,565)
- 2019 – 2021 United States Geological Survey State Water Resources. Manganese sourcing and transport in Massachusetts groundwater: Understanding dissolution mechanisms and creating a temporally variant database. PI David F. Boutt, Co-PI Justin Richardson (\$9,996)

- 2019 – 2021 United States Department of Agriculture - Natural Resources Conservation Service  
“Development and Application of PXRF Protocols to Potentially Hazardous Metals in Soils of Urban Forests and Gardens”. Justin B Richardson, Subaward to Nicolas Perdrual. (\$76,588)
- 2018 – 2021 National Science Foundation “Development of gallium-aluminum ratios as a tracer of the Critical Zone behavior of Al” (Project total: \$476,692) Grant #1660923 - Louis A. Derry; Subaward to UMass Amherst to Justin B. Richardson (\$66,910)
- 2016 - 2018 National Science Foundation “Collaborative Research: GEODES: GEOscience Diversity Experiential Simulations”. Jason, Chen, Brian, Teppen, Heather Houlton H, Carolyn C. Brinkworth, Andrea Motto, Jerome Jackson, Justin B. Richardson (Total project \$399,968)
- 2014 Graduate Alumni Research Award – Dartmouth College “Dirty soil: the fate of lead and mercury in earthworms”. \$1000
- 2013 - 2015 Ernest Everett Just Program Graduate Fellow – Dartmouth College
- 2013 Northern Studies Grant – Dartmouth College “The effect of vegetation type and soil properties on Hg accumulation at Mt. Moosilauke and Chase Mountain”. \$3,500
- 2011 - 2015 Dartmouth College Fellowship – Dartmouth College
- 2010 Alliance of Graduate Education and Professoriate – UC Riverside/ National Science Foundation
- 2009 University of California Riverside Undergraduate Research Grant

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#### INVITED PRESENTATIONS

- 2025 Richardson JB, “Misbehaving misplaced rocks - biogeochemistry of toxic elements from ultramafic rock weathering in the northeastern US” James Madison University – Department of Geology and Environmental Science. October 11<sup>th</sup> 2025.
- 2025 Richardson JB, “Jumping worm impacts on soil nutrients”. University of Maine extension office, virtual symposium and training workshop “Jumping Worms: A Conversation. What We Know & What We're Learning”. June 18<sup>th</sup> 2025.
- 2023 Richardson JB, “Trace element spatial distributions and temporal changes during the Anthropocene and their implications for SOC dynamics” B12B - Soils in the Anthropocene: Cross-Scale Mechanisms of Stabilization and Change. American Geophysical Union – San Francisco.
- 2022 Richardson JB, “Nutrient and potentially toxic element soil biogeochemistry - linkages across bedrocks and glacial landforms” Iowa State University Oct 18<sup>th</sup>.
- 2022 Richardson JB, “Linking biogeochemistry from the soil profile to the watershed scale - discerning anthropogenic versus geogenic processes” Dartmouth College Sept 16<sup>th</sup>.
- 2022 Richardson JB, “Invasive *Amyntas* and *Metaphire* earthworms in New England forests, their damage to soils and alteration of nutrients” Northeast Organic Farming Association - Summer Meeting August 6<sup>th</sup>.
- 2022 Richardson JB, “Applying trace metal biogeochemistry to mines and wines: linking rocks to plants and people” University of Virginia – Dept. Environmental Science - Spring Seminar April 21<sup>st</sup>.
- 2022 Richardson JB, “On metals in worms and wines, applications of biogeochemistry to agricultural and environmental contaminants” Pennsylvania State University - 24<sup>th</sup> Annual Environmental Chemistry & Microbiology Student Symposium – Keynote address. In-person, State College, PA April 9<sup>th</sup>.
- 2022 Richardson JB, “Mines and wines – application of biogeochemistry from rocks to plants and humans”. University of Connecticut. Dept of Geosciences. Spring Seminar Series. In-person, Storrs, CT April 1<sup>st</sup>.

- 2021 Richardson JB, "Exploring forest soil health: Geochemical and glaciological controls on tree nutrient acquisition and growth across New England" University of New Hampshire - Fall Environmental Science Seminar Series for the Natural Resources and Earth Systems Science.
- 2021 Richardson JB, "Exploring effects of potentially toxic metals on forest health and drinking water from ultramafic lithology" University of Rhode Island - College of the Environment and Life Sciences – Biological and Environmental Sciences Colloquium Series. series. Virtual.
- 2021 Richardson JB, "Abandoned Mines and Metals in Wines - geologic and human impacts on trace metal biogeochemistry." Georgia State University - Department of Geosciences Spring Seminar series. Virtual.
- 2020 Richardson JB, "Invasive Earthworms in New England Forests, their damage and their spread." Wistariahurst Museum, Holyoke MA. Virtual.
- 2020 Richardson JB, "Terroir biogeochemistry: differences in nutrients and toxic metals in wines across three regions of the USA" University of Reading, Reading, UK. Fall Seminar speaker. Virtual.
- 2020 Richardson JB, "Importance of Soil-Surface Water Interactions – Modern Transport and Sequestration of Historical Arsenic and Lead Pollution in the Shetucket, Quinebaug, and Yantic Watersheds, Connecticut" Geological Society of America Meeting October.
- 2020 Richardson JB, "Trace metal biogeochemistry in the rock-soil-plant continuum: mine and wine case studies" College of William and Mary. Williamsburg, VA.
- 2019 Richardson JB, "Trace element biogeochemistry in terrestrial environments – careers and state of the art" Holyoke Community College STEM Scholars series. Holyoke, MA.
- 2019 Richardson JB, "Thinking past NPK, are meso and micronutrients limiting New England forests?" Harvard Forest Seminar series. Petersham, MA.
- 2019 Richardson JB, "Deciphering geologic and anthropogenic toxic metals across New England". University of Vermont, Department of Geology, Spring Seminar series. Burlington, VT.
- 2019 Richardson JB, "Toxic and Essential Trace Metals in New England Soils and rocks". Williams College, Spring Seminar Series.
- 2018 Richardson JB, "Understanding the role of vegetation and deep regolith in manganese biogeochemistry". Lamont-Doherty Earth Observatory – Columbia University.
- 2018 Richardson JB, "Manganese contamination from Massachusetts to Virginia: disservices of the Critical Zone". Boston University – Fall Seminar Series.
- 2017 Richardson JB "Applications of Geochemistry to Critical Zone Science" The Dr. Booker Juma Seminar Series, Fayetteville State University, Fayetteville, NC.
- 2017 Richardson J.B. "Geoscience: moving from 'Rocks for Jocks' to tackling the future of Earth" Cornell Engineering CATALYST Academy. Cornell University, Ithaca, NY.
- 2017 Richardson J.B. "Mercury in the Critical Zone: A global problem with few global solutions" Earth System Science Seminar. Stanford University, Palo Alto, CA.
- 2017 Richardson J.B. "Metal pollutants and geochemical tracers in the Critical Zone" Virginia Polytechnic Institute and State University, Blacksburg, VA.
- 2017 Richardson J.B. "Trace metals in the Critical Zone across the northeastern United States" University of Massachusetts Amherst, Amherst, MA.
- 2016 Richardson J.B. "Tracing Critical Zone processes using trace metals" Brown University, Providence, RI.
- 2016 Richardson J.B. "A tale of two metals: Lead and Gallium in the Critical Zone" Johns Hopkins University, Baltimore, MD.

- 2016 Richardson J.B. “Critical Zone science – In and Beyond the Classroom” Teacher Resources Day, Museum of the Earth, Ithaca, NY.
- 2016 Richardson J.B. “Cross-scale discussion: Changes to mercury and lead biogeochemistry from invasive earthworms in New England forests” Biogeochemistry and Climate Seminar Series, Cornell University, Ithaca, NY.
- 2015 Richardson J.B., “Earthworm and vegetation effects on mercury accumulation in forest soils in northern New England” Plant and Soil Science Seminar Series, University of Vermont, Burlington, VT.

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#### CONFERENCE AND SOCIETY PRESENTATIONS

(\*\*\*) Indicates Undergraduate and (\*\*) Graduate Mentee Author/Presenter

- 2025 Wijesinghe D, Richardson JB, Garcia Jr., A., Hughes C., Harper E., Petrova M “Sediment Deposition Processes in Cave Ecosystems: Cave Study in Water Sinks Cave highland County VA” Geological Society of America – Southeastern section meeting. Harrisonburg VA March 20<sup>th</sup> 2025.
- 2025 Kohlhaas R<sup>\*\*\*</sup>, Schroeder SE<sup>\*\*\*</sup>, Richardson JB, “Accumulation of Phosphorus and Potentially Toxic Elements in Stream Water, Bottom Sediments, and Suspended Sediments in Tributaries of Lake Anna, Virginia” Geological Society of America – Southeastern section meeting. Harrisonburg VA March 21st 2025.
- 2025 Richardson JB, “Comparing Nutrient vs Toxic Element Biogeochemistry in Mid-Atlantic and New England Forests – Similarities Aboveground but Differences Belowground” Geological Society of America – Southeastern section meeting. Harrisonburg VA March 20<sup>th</sup> 2025.
- 2025 Schroeder SE<sup>\*\*\*</sup>, Kohlhaas R<sup>\*\*\*</sup>, Richardson JB, “Survey of Mining Waste at Abandoned Mine Sites and Potential Remediation with Lime and Biochar Amendments” Geological Society of America – Southeastern section meeting. Harrisonburg VA March 21st 2025.
- 2025 Fuglie KGS<sup>\*\*\*</sup>, Lerdau MT, Faddis R<sup>\*\*\*</sup>, Richardson JB, “Oxide and Clay Mineral Stabilization of Soil Organic Carbon Across Land-Uses and Geomorphic Position in the Piedmont Virginia, USA” Geological Society of America – Southeastern section meeting. Harrisonburg VA March 21st 2025.
- 2025 Wu EA<sup>\*\*\*</sup>, Rice AM<sup>\*\*</sup>, Richardson JB, “The Influence of Rock and Soil Nutrients on the Foliar Nutrient Resorption Efficiency: A Comparison between New England and Virginia” Geological Society of America – Southeastern section meeting. Harrisonburg VA March 21st 2025.
- 2024 Richardson JB, Dobson AM “Phosphorus biogeochemistry in contrasting MidAtlantic and New England deciduous forests - trees dominate cycling but soils control storage” American Geophysical Union Annual Meeting. Washington DC December 13<sup>th</sup> 2024.
- 2024 Truong MT<sup>\*\*</sup>, Richardson JB, “Urban Road Dust Mitigation By Urban Forest Canopy Near Interstate Highways In Mid-Atlantic Cities: Cu and Zn Profile And Health Risk Assessment” American Geophysical Union Annual Meeting. Washington DC December 10<sup>th</sup> 2024.
- 2024 Ackerman A<sup>\*\*</sup>, Limaye AB, Copenheaver CA, Peterson J, Frye E, Richardson JB, “Investigating the Effects of Landslide Disturbance on Soil and Vegetation in a Steep Landscape in Central Virginia” American Geophysical Union Annual Meeting. Washington DC December 9<sup>th</sup> 2024.
- 2024 Faddis RJ<sup>\*\*\*</sup>, Lerdau MT, Chinn AN, Irvine AK, Himmel OO, Barnard JA, Richardson JB. “Soil organic carbon along nested soil catenas and across land-uses on the Piedmont Virginia, USA”. Soil Science Society of America Annual Meeting. San Antonio Texas. November 13<sup>th</sup> 2024.

- 2024 Richardson JB “Does pedogenesis or temperature control nutrient oxyanion (phosphorus and molybdenum) cycling in temperate forests?” Soil Science Society of America Annual Meeting. San Antonio Texas. November 13<sup>th</sup> 2024.
- 2024 Richardson JB “Linking pedogenesis with geology through an Appalachian Mountain soil transplant study and Southern California bedrock transect” Soil Science Society of America Annual Meeting. San Antonio Texas. November 12<sup>th</sup> 2024.
- 2024 Pavlovich M., Kaste JM, Richardson JB. Measuring the Total Lead Soil Burden in Organic Horizons Along an Elevational Profile in the Green Mountain Range of Northern Vermont. Geological Society of America Annual Meeting. April 15 2024
- 2024 Richardson JB, Dobson AM “Does climate or tree roots control C and nutrient sequestration in temperate forests? A soil translocation approach” 11th BIOGEOMON International Symposium on Ecosystem Behavior. San Juan, Puerto Rico Jan 8<sup>th</sup> 2024.
- 2024 Richardson JB “Importance of inherited Fe oxides on toxic (As, Cd, Pb) and potentially toxic metals (Cu, Ni, Zn) from grey shale-derived soils on geologic timescales” 11th BIOGEOMON International Symposium on Ecosystem Behavior. San Juan, Puerto Rico Jan 9<sup>th</sup> 2024.
- 2023 Cable B<sup>\*\*\*</sup>, Bloom E<sup>\*\*\*</sup>, Perdrial N, Treto V., Underwood K., Shanley JB, Hicks N, Li L, Kincaid DW, Richardson JB, Seybold EC, Stewart B, Vierbicher A, Perdrial JN, Rice A. “Disturbances, Resilience, and the Role of Calcium-Bearing Minerals Weathering in Northeastern Forests”. American Geophysical Union – San Francisco.
- 2023 Richardson JB, Clark EV “Neoformed Iron Oxides Prevent Arsenic and Lead in Sulfidic Schists from Contaminating Streamwater at the Watershed Scale in Massachusetts, USA” B32D Trace Element Biogeochemical Cycling and Environmental Consequences II. American Geophysical Union – San Francisco.
- 2023 Richardson JB, Dobson AM, Keiser AD “Uprooting Parent Material Controls: Investigating Climate and Root-Priming Effects on C and Nutrient Sequestration within Homogenized Soil Columns” Soils in the Anthropocene: Cross-Scale Mechanisms of Stabilization and Change. American Geophysical Union – San Francisco.
- 2023 <sup>\*\*\*</sup>Hanley ML, Vukicevich E., <sup>\*\*</sup>Rice AM, Richardson JB, “Legacy of soil pollution drives arsenic, mercury, and lead bioaccumulation in edible and medicinal mushrooms across southern New England” ASA, CSSA, SSSA Annual Meeting. St. Louis, MO Oct 30<sup>th</sup> 2023.
- 2023 <sup>\*\*</sup>Rice, AM., Perdrial N., D’Amato AW., Richardson JB “Unveiling Nutrient Sourcing in Forest Ecosystems: A Novel Application of Ca and Mg Isotopes to Determine Dominant Nutrient Sources for Trees across Forest Development. ASA, CSSA, SSSA Annual Meeting. St. Louis, MO Oct 30<sup>th</sup> 2023
- 2023 <sup>\*\*</sup>Rice AM, Richardson JB, “Weathering Rates of Rocks and Soils: Determining Base Cation Release to Northern Hardwood Forests across Lithologic and Pedogenic Gradients” ASA, CSSA, SSSA Annual Meeting. St. Louis, MO Oct 30<sup>th</sup> 2023. (Poster- 1st Place Division Award)
- 2023 Richardson JB “Revisiting George Borst’s Pedologist’s Chants Cantorum with Three Cantata Variations” ASA, CSSA, SSSA Annual Meeting. St. Louis, MO Oct 30<sup>th</sup> 2023.
- 2023 Richardson JB “Basalt Enhanced Rock Weathering Effect on Soil Nutrients and Physical Properties-Two Case Studies Organic Farms in New England, USA” ASA, CSSA, SSSA Annual Meeting. St. Louis, MO Oct 30<sup>th</sup> 2023.

#### Presentations prior to joining UVA

- 2022 Richardson JB “Incorporating Inorganic Nutrients into Forest Soil Health Assessments: Considerations for Total Concentrations over Plant Available Concentrations” ASA, CSSA, SSSA Annual Meeting. Baltimore, MD November 8<sup>th</sup> 2022.

- 2022 Richardson JB., Rice AM., Mischenko IC., Spatial Variability of Soil Carbon Among Geomorphic and Mineralogical from Forest Stand to Landscape Scales across New England, USA ASA, CSSA, SSSA International Annual Meeting, Baltimore, MD.
- 2022 \*\*Rice, A., N. Perdrial, V. Treto, A. D'Amato, G. Smith, and J. Richardson. 2022. Parent Material Controls on Nutrient Richness and Resilience Following Forest Harvesting in Northern Hardwood Ecosystems. ASA, CSSA, SSSA International Annual Meeting, Baltimore, MD. (Poster- 3rd Place Division Award)
- 2022 Richardson JB “Assessing the accuracy and precision of pXRF measurements of potentially toxic trace elements in field soils”. Northeast Cooperative Soil Survey. Applied Technology Committee meeting – University of Delaware. Online June, 2022
- 2022 Richardson JB, Mischenko IC, Butler MJ, “Forest soil accumulation and suspended sediment transport of Hg in the Connecticut, Merrimack, and Thames River Watersheds” Northeastern Geological Society of America. Reading, PA March 19<sup>th</sup>
- 2022 Richardson JB, “Does soil development control sourcing or release of toxic (Cd, Pb) and potentially toxic metals (Cu, Ni) from grey shale-derived soils?” Northeastern Geological Society of America. Reading, PA March 19<sup>th</sup>
- 2021 Street BB., Richardson JB, “Nutrient and Trace Metal Dissolution from Forest Soils across a Climate Gradient Under Forest Floor and Microbial Treatments” Soil Science Society of America 2021. Virtual
- 2021 Richardson JB, Mischenko IC, “Traditional Plant Availability Measures of Ca, P, K, and Mg in the Rhizosphere Fail to Predict Uptake By Northern Hardwoods” Soil Science Society of America 2021. Virtual
- 2021 Zuñiga LX\*\*, Boutt DF, Richardson JB, “Manganese Sourcing and Transport in Massachusetts Groundwater: Understanding Dissolution Mechanisms and Creating a Temporally Variant Database” Northeastern Geological Society of America 2021. Virtual
- 2021 Richardson JB, Butler MJ\*\*\* “Forest soil and River Water Cu, Ni, Pb, and Zn across Seven Watersheds in Eastern Connecticut – Insights on Sequestration and Export”. Northeastern Geological Society, March 15 2021. Virtual talk
- 2021 Mischenko IC\*\*\*, Richardson JB “Assessing Lead Bioavailability and Uptake in Forests and Their Soils Across New England, Hints at Modern and Historical Lead Cycling”. Northeastern Geological Society, March 15 2021. Virtual talk
- 2020 Richardson JB, Zuñiga LX\*\*\* “Manganese Dissolution in the Critical Zone – Effects of Minerals, Organic Ligands, and pH”. Soil Science Society of America November 2020. Virtual
- 2020 Mischenko IC\*\*\*, Mackowiak TJ\*\*\*, Richardson JB “Geologic and Anthropogenic Controls on the Regional Scale Variability of Nutrients in Forest Soils across Southern New England”. Soil Science Society of America November 2020. Virtual
- 2020 Mackowiak TJ\*\*\*, Richardson JB “Trace Metal Sources in Urban Southern California Soils”. Geological Society of America October 2020. Virtual
- 2020 Mistikawy JB\*\*\*, Mischenko IC\*\*\*, Mackowiak TJ, Richardson JB “Chromium, Manganese, Nickel, and Cobalt Mobility from Mafic-to-Ultramafic Mine Spoil Weathering in Western, Massachusetts, USA”. Geological Society of America October 2020. Virtual
- 2020 Sirkovich EC\*\*\*, Perdrial NS, Richardson JB “Contributions to PXRF measurement error for trace metals in urban soils across properties and conditions”. Geological Society of America October 2020. Virtual
- 2020 Richardson JB “Exploring measurement error with portable XRF trace metal measurements – Moving towards a standard Protocol”. Northeast Cooperative Soil Survey – Virginia Tech. Online June, 2020

- 2020 Sizmur T., Richardson JB “Earthworms accelerate the biogeochemical cycling of potentially toxic elements: Results of a meta-analysis”. European Geological Society – General Assembly. Online April, 2020
- 2019 Fitzgerald EJ\*\*\*, Richardson JB, “The influence of microbial communities and secondary oxides on Manganese carbonate and amphibolite weathering”. Northeastern Section – Geological Society of America Meeting Portland Maine. March 18th, 2019.
- 2019 Marek R\*\*\*, Richardson JB, “Investigating Geologic Controls on Ecophysiology and Nutrient Cycling in the Forest of New England”. Northeastern Section – Geological Society of America Meeting Portland Maine. March 18th, 2019.
- 2019 Braithwaite B\*\*\*, Richardson JB, “Retention of Trace Metals in Urban Forests and Soils Near Municipal Waste Incinerators Facilities in the Northeastern United States”. Northeastern Section – Geological Society of America Meeting Portland Maine. March 18th, 2019.
- 2019 Richardson JB, “Manganese uptake by northern hardwoods on Mn-carbonate rich Mine-tailings – a geochemical conundrum in Western Massachusetts”. Northeastern Section – Geological Society of America Meeting Portland Maine. March 18th, 2019.
- 2019 Richardson JB, King EK “Regolith weathering and iron oxides influence vanadium retention and stream export at four Critical Zone Observatories”. Soil Science Society of America Meeting, San Diego CA. January 8th, 2019.
- 2019 Palmer CA, Richardson JB, Derry LA “Greater gallium sorption rates due to intense chemical weathering: variations across four CZOs in the United States”. Soil Science Society of America Meeting, San Diego CA. January 8th, 2019.
- 2018 Richardson JB, “Developing Geochemical Mn/Ca Ratio as a Tracer for Mn Contamination”. Annual Conference on Soils, Sediments, Water and Energy, Amherst MA.
- 2018 Richardson JB, “Phase Partitioning and Mobility of Mn across Six Critical Zone Observatories: Comparing Plant and Bedrock Controls”. Northeastern Section - Geological Society of America Meeting Burlington Vermont. March 18<sup>th</sup>, 2018.
- 2017 Richardson JB, Richter D “Mercury in Soils of the Calhoun Critical Zone Observatory: Importance of Redox Features in Sequestration.” Society of America Annual Meeting. Tampa, FL.
- 2017 Richardson JB, Derry LA “Gallium Sorption and Inclusion in Al and Fe Oxides” Soil Science Society of America Annual Meeting. Tampa, Florida.
- 2017 Richardson JB, Richter DD, Derry LA. “Weathering losses and phase partitioning of Aluminum in the Critical Zone using Gallium/Aluminum ratios” Geological Society of America Joint Northeastern / North-Central Annual Meeting. Pittsburgh, PA.
- 2016 Richardson J.B., Derry L.A. “Using gallium as a tracer of aluminum in the Critical Zone: influences on terrestrial cycling from vegetation.” American Geophysical Union Fall Meeting, San Francisco, CA.
- 2014 Richardson J.B., Friedland A.J., Görres J.H., Renock D.J., Jackson B.P. “Invasive and exotic earthworms: an unaccounted change to mercury cycling in northeastern US forest soils” American Geophysical Union Fall Meeting, San Francisco, CA.
- 2014 Richardson J.B. “Mercury Cycling in Soils: Existing Knowledge and Areas of Consideration” Soil Science Society of America General Meeting, Long Beach, CA.
- 2014 Richardson J.B., Friedland A.J., Vario C.L. “Mercury pools in forest soils along three chronosequences in the northeastern US” Soil Science Society of America General Meeting, Long Beach, CA.
- 2014 Richardson J.B., Friedland A.J., Vario C.L. “Mercury, Pb, Cu and Zn concentrations in forest soils along three clear-cut chronosequences in northeastern US” Biogeomon 8th International Symposium on Ecosystem Behavior, University of Bayreuth, Germany.

- 2013 Richardson J.B., Friedland A.J., Kaste J.M. Jackson B.P. "Linking mercury and lead retention in the forest floor across the northeastern United States" Soil Science Society of America General Meeting, Tampa, FL.
- 2012 Richardson J.B., Friedland A.J., Jackson B.P. "The effects of soil properties and vegetation on mercury accumulation in upland forest soils across the northeastern United States" Soil Science Society of America General Meeting, Cincinnati, OH.
- 2012 Richardson J.B., Friedland A.J., Engerbretson T.R., Kaste J.M., Jackson B.P. "Temporal changes and vertical distribution of trace metals in upland forest soils across the northeastern United States" Biogeomon, 7<sup>th</sup> International Symposium on Ecosystem Behavior, Northport, Maine.
- 2010 Richardson J.B., Jenerette G.D., Chatterjee A., "Soil respiration patterns along a 3000 m elevation gradient" Western Soil Science Society Annual Meeting, Las Vegas, Nevada

### TEACHING EXPERIENCE

- 2025 EVS2800, Fundamentals of Geology, Professor. 94 students in course. Revised course design, created lectures, examinations, assignments, designed new laboratory activities, designed new off-campus field trips graded assignments and exams.
- 2024 EVSC 4270/7270, Introduction to Soil Science, Professor. 18 students in course. Lead course design, lectures, examinations, assignments, projects, designed laboratory sections, grading assignments, exams, and reports.
- '20, '21, '22 ENVI SCI 101 Introduction to Environmental Science, Professor. 210 students in course. Designed course lectures, assignments, discussion activities and exams, 2 TAs.
- 2022 ENVI SCI/STCK 585 Inorganic Contaminants in Soil, Sediment, and Water Professor. 15 students in course. Designed course lectures, assignments, and projects.
- 2019 GEOL/ENVI SCI 390J Landscape and Watershed Scale Biogeochemistry, Professor. 12 students in course. Designed course lectures, assignments, field trips, laboratory activities and exams, graded all materials.
- '18, '21, '23 GEOL 565 Soil Formation and Classification Professor. 9 students in course. Designed course lectures, assignments, and field trips. Guided field trips across MA and VT.
- 2018, 2019 GEOG 110 Global Environmental Change, Professor. 180 students in course. Designed course lectures, assignments, and exams, graded reports and exams.
- 2015 ENVS 25 Ecological Agriculture, Professor. 45 students in course. Designed course, taught laboratory sections, lectured, graded reports and exams.
- 2014 Dartmouth Adventures in STEM. Mentored 14 first-year underrepresented students through one week of colloquiums, lectures and exercises in STEM fields.

### ACADEMIC ACHIEVEMENT AWARDS AND DISTINCTIONS

- 2025 SSSA – Forest, Range, and Wildlands section – Early Career Lecture
- 2015 Graduate Student Teaching Award – Dartmouth College
- 2014 Outstanding Department Teaching Assistant – Dartmouth College
- 2010 Chancellor's Honor List – UC Riverside
- 2009 – 2010 Dean's Honor List: Spring, Winter, and Fall Quarter – UC Riverside

### UNIVERSITY/COLLEGE/DEPARTMENT SERVICE

- 2024 – Present UVA Office of Citizen Scholar Development – Undergraduate research reviewer and 'Behind the bench' host.
- 2024 – Present Dept of Environmental Science Graduate Academic Record Committee; Goodell Fund Committee;
- 2022 UMass Amherst Library 'Open for Climate Justice' Panel member

2018 – 2023	UMass Geoscience - Randolph 'Bill' Bromery Committee for recognizing African-American contributions to geosciences
2020 – 2021	UMass Geosciences - Bylaws committee chair
2016 – 2017	Cornell University Postdoctoral Advisory Committee
2012 – 2013	Vice-President/Acting President of Dartmouth College Graduate Student Council

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#### **NATIONAL/INTERNATIONAL SERVICE**

2020 – present	Associate Editor for journal <i>Biogeochemistry</i>
2025 – 2028	Soil Science Society of America – Forest, Range, and Wildland Soils elected division Chair
2025	Geological Society of America Southeastern Section – Session Convener “Biogeochemical Cycling of Elements at the Earth’s Surface Across Space and Time”
2024	Organized Biogeomon Workshop “Broadening and Decolonizing Biogeochemistry”
2024	National Academy of Science’s US National Committee for Soil Sciences - Meeting panel sessions.
2023	Soil Science Society of America - Session Co-convener “Humans Affecting and Leveraging Mineral Weathering Poster”
2023	National Science Foundation – Ad hoc Evaluator
2023	Swiss National Science Foundation – Ad hoc Evaluator
2020 – 2023	Research Needs Committee Chair for USDA National Cooperative Soil Survey -
2023	Canada Foundation for Innovation – Ad hoc Reviewer
2022	National Science Foundation Grant Reviewer/Panel Member
2022	United States Environmental Protection Agency - Integrated Science Assessment (ISA) for Lead (Pb) Panel
2021	United States Department of Agriculture – National Institute of Food and Agriculture – Grant Reviewer/Panel Member
2021	National Science Foundation Grant Reviewer/Panel Member
2021	Northeastern Geological Society of America – Virtual Session Convener “Biogeochemical Cycling of Environmental Contaminants”
2020	Geological Society of America – Virtual Session Convener “Environmental Geochemistry and Health”
2020	National Academies of Science, Engineering, and Medicine's U.S. National Committee for Soil Sciences – Future of Soil Science Panelist
2020	NSF Geochemical Data Workshop in Atlanta February 18–20, 2020 - Participant
2019 – 2021	Soil Science Society of America – Communication and Outreach Committee
2019	Soil Science Society of America - Session Convener “Role of Soils in Mediating the Critical Zone”
2019	Geological Society of America Northeastern Section – Session Convener “Soils: Processes at the Bio-Geo Interface”
2016	National Science Foundation Grant Reviewer/Panel Member
2014	Chaired Mercury in soils: patterns and processes Session SSSA Fall Meeting

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#### **PROFESSIONAL SOCIETIES**

2012 – Present	Member of Geological Society of America, Member of American Geophysical Union
2010 – Present	Member of Soil Science Society of America

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#### **EDUCATION AND OUTREACH**

2025	Virginia Dept. of Energy – Research Symposium
2023	Yale Center for Carbon Capture - Symposium on Enhanced Rock Weathering
2023	Thames River Basin Association – Talk and data interpretations
2019-2023	UMass Amherst Massenberg STEM institute session leader

2018-2023	Holyoke Community College STEM Starter Academy sessions
2023	Northeast Organic Farming Association – NY Winter Conference (51 attendees)
2022	Springfield Renaissance Middle School demonstrations.
2022	Letter to Editor “Continuing Bill Bromery’s Legacy at UMass” – Boston Globe
2022	Northeast Organic Farming Association Podcast interview
2021	UMass Amherst Extension – Invasive Earthworm (700+ attendees)
2021	Radio interview for 91.1 FM <i>Undercurrents</i> (anchor.fm/undercurrents-radio)
2020	Executive Board Member of <i>Greater Northfield Water Association</i>
2020	“Cancel Earthworms” by Julia Rosen in <i>The Atlantic</i>
2020	Measured soil fertility and tree health for Masson Ridge Land Conservation
2019	“We tested our soil the old-fashioned way — we ate it. It was like nothing we expected” By Gene Tempest in Boston Globe.
2016 – 2019	Adventures in the Critical Zone Blog
2016 – 2018	Cornell University Men of Color Group
2016	GEO Opportunities for Leadership in Diversity (GOLD) Idea Laboratory
2016	Visits with Howard University’s Math and Science Middle School

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## ADVISING AND MENTORING

### Graduate Student Researchers – Serving as Chair

In Progress	PhD Minh (Robin) Tri Truong “Identifying vehicle air pollution using stable isotopes”.
In Progress	M.S. Nischal Acharya “Biochar and Basalt Rock Dust Carbon and Nutrient Dynamics in soybean cropping systems in Sandy and Silt Loam Soils”.
2025	PhD Alexandra M. Rice “Mineralogical and Geochemical Controls on Nutrient Dynamics and Forest Productivity in Managed Northeastern U.S. Forests”.
2022	M.S. LeAnn X. Zuñiga, “Sourcing and transport of Manganese in Groundwater in Western Massachusetts”. UMass Amherst – Dept of Geosciences. Co-advised with Dr. David Boutt. NSF-GRFP Honorable Mention
2020	M.S. Hillary Kenyon, “Phosphorus Mobility and Availability in Soils and Sediments.” UMass Amherst Stockbridge School of Agriculture. Co-chair with Dr. Mickey Spokas.
2020	M.S. Corey A. Palmer, “Investigating Gallium Inclusion in Aluminum and Iron Oxyhydroxides”. UMass Amherst Dept of Geosciences. Chair.

### Graduate Student Researchers – Serving as committee member

In Progress	PhD Will B. Loner –Evaluating effects of multiple spongy moth defoliation events and weather on growth and mortality across different preference and size classes of host trees
In Progress	PhD Willow S. Lovecky – Nesting material affect solitary wasps and bees.
In Progress	PhD Stephanie Petrovick – DRAG net soil and seedling responses.
2025	PhD Maria Rosetti – “Evaluating biochar for use as a roadside soil amendment for stormwater runoff management”. University of Virginia - Civil and Environmental Engineering Dept. PhD.
2025	MS Alejandra Vega Gonzalez – “Identifying Ice-Rafted Debris Offshore of Antarctica Using a Multi-analysis Approach” University of Virginia Dept of EVSC M.S. thesis.
2025	MS Abigail M. Ackerman – “Effects of Landslide Disturbance on Soil and Vegetation in a Steep Landscape in Central Virginia” University of Virginia Dept of EVSC M.S. thesis.
2024	PhD Xuyen Mai. “Characterizing the Formation of Manganese Oxides in Manganese Biological Filtration with Sand and Ceramic Media”. UMass Amherst – Civil and Environmental Engineering Department.
2023	MS Ashley Grengs – “Rare Earth Element Distributions in Forest Soils Across Bedrock Gradients in New Hampshire and Vermont”. University of New Hampshire – Earth Science.
2023	PhD Brian Saccardi – “Sources and Controls of Carbon Dioxide in Inland Waters at Watershed, Regional, and Continental Scales”. UMass Amherst – Geosciences Dept.

- 2020 MS Sandra Walser – “Trace Metal Contamination in Urban Soils: A field to Laboratory Methodological Framework for Characterization and Education” University of Vermont
- 2018 M.S. Rachele Lacroix. “Mineral and Redox Controls on Soil Carbon Cycling in Seasonally Flooded Soils”. UMass Amherst – Stockbridge School of Agriculture.

### **Undergraduate and Postbaccalaureate Researchers**

- Exp. 2026 Chattan Haselden – Senior thesis: “*Spatial patterns of Toxic elements in soils and road dust across six southeastern cities*”. Chair
- Exp. 2026 Karinna Fuglie – Distinguished Majors thesis: “*Topographical and land-use controls on soil carbon sequestration and nutrient cycling*”. Chair
- Exp. 2026 Samuel Wright – Distinguished Majors thesis: “*Nutrient biogeochemical cycling rates under varying timber harvesting intensities using field and process-based modeling*”. Chair
- 2023 Owen Porterfield – Conducted field work and laboratory experiments. Honors thesis: “*Assessing Changes in Lead and Mercury Distributions and Cycling Dynamics in Undisturbed Forests of the Northeastern United States Between 2011 and 2021*”. Chair
- 2023 Marissa Hanley – Conducted field and laboratory work. Senior thesis topic: “*Analyzing the Uptake of Toxic and Nutrient elements in Foraged Edible and Medicinal Mushrooms throughout New England’s Connecticut River Valley*”. Chair
- 2022 Bailee B. Street. Conducted field work and laboratory experiments. Senior Thesis: “*Nutrient and Trace Metal weathering and transport from Forest Soils Under Forest Floor and Na Azide Treatments*”. Chair.
- 2022 Stephanie Thrasher. Collected rocks and laboratory analyses. Senior Thesis: “*Leaching of trace metals from sulfidic schists and other rock formations in Central Massachusetts*”. Chair.
- 2021 Jahziel Chase. Completed digestions of wines and vineyard plants and soils, co-authored publication.
- 2021 Eric Sirkovich. UMass Amherst Commonwealth Honors College Senior Thesis: “*Influence of Variable Soil properties on pXRF Analyses of Trace element Concentrations in Urban Soils*”. Chair.
- 2020 Ivan Mischenko. Collected forest soil and tree samples. Measured trace elements and conducted spectral reflectance experiments.
- 2020 Ainsley McStay. Sampled community garden soils for trace metals and macro nutrients and conducted greenhouse experiment on Pb, Cd, As uptake by calendula, cilantro, green amaranthus, chamomille
- 2020 Mark S. Butler. UMass Amherst Commonwealth Honors College Senior Thesis: “*Riparian soil retention and sediment and dissolved transport of toxic metals in the Thames River Watershed, Connecticut*” Chair.
- 2020 Trevor J Mackowiak. UMass Amherst Commonwealth Honors College Senior Thesis: “*An Analysis of Trace Metals in Southern California Soils Across Lithologies and an Urban, Climatic Gradient*” Chair.
- 2019 Leon Moore. Developed protocol for Cesium 137 measurement using gamma counter. Collected subsamples from USDA-NRCS subaqueous soil coring. Analyzed hundreds of soil, sediment, and vegetation samples for Hg. Co-authored study.
- 2019 Brendan Braithwaite, UMass Amherst Commonwealth Honors College Senior Thesis: “*Retention of trace metals in urban forests and soils near municipal waste incineration facilities in northeastern U.S.*”, Chair.
- 2019 Rudolph S. Marek IV, UMass Amherst Commonwealth Honors College Senior Thesis: “*Investigating geologic controls on ecophysiology and nutrient cycling in the Forests of New England*, Chair.
- 2018 Benjamin Kumpf, Wooster College Undergraduate Senior Honors Thesis: *Gallium and Aluminum during igneous rock weathering*, Chair.

2014

Isabel Caldwell, 2014. Dartmouth College: Undergraduate Senior Honors Thesis: *Arsenic and Uranium Mobilization and Accumulation from Bedrock to Soil throughout New Hampshire*, Chair.

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**JOURNAL PEER-REVIEWER FOR 143 MANUSCRIPTS SINCE 2017 (41 MANUSCRIPTS SINCE JOINING UVA)**

*Biogeochemistry, Soil Biology and Biochemistry, Geoderma, Environmental Science and Technology, Catena, Plant and Soil, Science of the Total Environment, Environmental Pollution, Journal of Geophysical Research, Nature-Scientific Reports, Environmental Science and Pollution Research, Journal of Plant Nutrition and Soil Science, Ecosystems, Journal of Geochemical Exploration, Journal of Hazardous Materials, Ecological Applications, Chemosphere, Geochimica Cosmochimica et Acta, Spectrochimica Acta Part B: Atomic Spectroscopy.*