Sarah M. Garvey

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EDUCATION & HONORS

Boston University (**Ph.D.**) 2023
Advisor: Lucy Hutyra (2023 MacArthur Fellow)

NSF-NRT Graduate Program in Urban Biogeoscience and Environmental Health Trainee (incl. 2-year tuition stipend & tuition scholarship) 2018 – 2023
Peter Fox Penner Award, Institute for Global Sustainability 2022
Dean's Fellowship (6-month stipend & tuition scholarship) 2017

University of Pennsylvania (**B.A.**), *magna cum laude* 2016
Distinction in Biology (Ecology & Evolutionary Biology). Thesis advisor: Brenda Casper.
Minor: Italian Studies.

RELEVANT EXPERIENCE

Program Manager, Assistant Research Scientist Mar. 2024 – Present
Appalachian Laboratory, University of Maryland Center for Environmental Science Frostburg, MD
The Global Nitrogen Innovation Center for Clean Energy and the Environment (NICCEE)

- Manage the operations and strategic direction of a global center jointly funded by NSF, NSERC-CRSNG and UKRI-EPSRC. Oversee program development, including research coordination, stakeholder engagement, and strategic planning.
- Lead and contribute to research on the environmental and socioeconomic impacts of green ammonia and sustainable nitrogen management across sectors.
- Organize educational and outreach programs, including the Nitrogen Summer Institute, and support development of a multi-national graduate course.

Doctoral research Sept. 2017 – Aug. 2023
Department of Earth & Environment, Boston University Boston, MA
Thesis: Forest fragmentation and urbanization effects on belowground biogeochemistry

- Studied urban biogeochemistry with a focus on the effects of urbanization and forest fragmentation on carbon storage and fluxes. Emphasis on soil and belowground responses to biogeochemical drivers and anthropogenic activity.
- Conducted own field, lab and analytical (R, QGIS) work. Led 10+ person teams in the field. Extensive lab skills; familiar with more than 10 different analytical laboratory techniques. Conducted soil temperature-sensitivity modeling; used univariate and multivariate analyses.
- Awarded over $20,000 in fellowships and grants, as well as 3+ years of tuition and stipend scholarships.

Research Assistant Sept. 2022 – May 2023
Institute of Global Sustainability, Boston University Boston, MA
Project: Data and Misinformation in an Era of Sustainability and Climate Change Crises

- Provided climate science guidance for *Thrust 1: The spread and evolution of climate change disinformation through social media*, a research investigation into the spread of climate change disinformation on Twitter and Reddit.

Program manager Jan. 2020 – Jan. 2023
Campus Climate Lab, Boston University Boston, MA

- Coordinated the launch of the Boston University Campus Climate Lab, a fund for student-led research projects to make the University more sustainable and reach climate action goals.
- Oversaw grant administration and managed budget; >$150,000 awarded across more than 25 projects.
- Wrote requests for proposals, organized and led information sessions, participated in proposal review. Provided feedback to applicants and one-on-one support to funded projects. Managed website.

Intern May 2021 – July 2021
Massachusetts Audubon Society Newburyport, MA
Coastal Resilience Program

- Collaborated with Coastal Resiliency director Dr. Danielle Perry to advance coastal vulnerability assessments and analyses (R, ArcGIS) in the mouth of the Merrimack River.

Research intern July 2016 – April 2017
MacArthur Agro-Ecology Research Center, Archbold Biological Station Lake Placid, FL
Wetland ecology research program

- Agro-ecology fieldwork on a remote cattle ranch. Collected field data to develop a predictive model (R) of wetland soil carbon storage in rangelands.

Research assistant Sept. 2015 – May 2016
Casper Lab, University of Pennsylvania Philadelphia, PA

- Laboratory and data processing for plant ecology experiments, including microscopy to characterize arbuscular mycorrhizal fungal colonization of plant roots and use of ImageJ to calculate leaf area index.

SKILLS & TECHNIQUES

- Software: Proficient in R, MS Office, Google Workspace, and scientific literature databases. Experience with ArcGIS, QGIS, and website design and management (WordPress).
- Field work in urban and remote locations; experienced with solo work and as field team leader, guiding large groups of scientists to collect data for multiple research investigations.
- Technical lab skills, including fluorometric and oxidative microbial enzyme assays, microscopy, hydrometer analysis, CN elemental analysis, and other analyses of soil properties and activity.
- Public speaking; project management and organization; written communication and editing; teaching.

PUBLICATIONS

Garvey, S. M., E. A. Davidson, C. Wagner-Riddle, A. Collins, M. Houser, T. Li, G. K. MacDonald, M. Tenuta, D. Kanter, P. Kyle, N. Wu, K. A. Congreves, Y. Wang, L. Cardenas, X. Zhang. Green ammonia: Emerging opportunities and urgent questions. *Nature Reviews Clean Technology, 1*(1), 10–11. https://doi.org/10.1038/s44359-024-00012-2. January, 2025.

Abramoff, R. Z., J. M. Warren, J. Harris, S. Ottinger, J. R. Phillips, **S. M. Garvey**, J. Winbourne, I. Smith, A. Reinmann, L. Hutyra, D. W. Allen, M. A. Mayes. Shifts in belowground processes

along a temperate forest edge. *Landscape Ecology*, 39(5), 100. https://doi.org/10.1007/s10980-024-01891-3. April, 2024.

Rindy, J. E., E. A. Pierce, J. Geddes, **S. M. Garvey**, J. Gewirtzman, L. R. Hutyra, P. H. Templer. Effects of Urbanization and Forest Fragmentation on Atmospheric Nitrogen Inputs and Ambient Nitrogen Oxide and Ozone Concentrations in Mixed Temperate Forests. *Journal of Geophysical Research: Biogeosciences,* 128, e2023JG007543. https://doi.org/10.1029/2023JG007543. December, 2023.

Tatsumi, C., K. F. Atherton, **S. M. Garvey**, E. Conrad-Rooney, L. L. Morreale, L. R. Hutyra, P. H. Templer, J. M. Bhatnagar. Urbanization and edge effects interact to drive mutualism breakdown and the rise of unstable pathogenic communities in forest soil. *Proceedings of the National Academy of Sciences*, 120 (36) e2307519120. https://doi.org/10.1073/pnas.2307519120. August, 2023. Media coverage: The Brink.

Garvey, S. M., P. H. Templer, J. M. Bhatnagar, L. R. Hutyra. Soils at the temperate forest edge: an investigation of soil characteristics and carbon dynamics. *Science of the Total Environment, 891,* 164320. https://doi.org/10.1016/j.scitotenv.2023.164320. May, 2023.

Caron, S., **S. M. Garvey**, J. Gewirtzman, K. Schultz, J. M. Bhatnagar, C. Driscoll, L. R. Hutyra, P. H. Templer. Urbanization and fragmentation have opposing effects on soil nitrogen availability in temperate forest ecosystems. *Global Change Biology*, *29*, 2156–2171. https://doi.org/10.1111/gcb.16611. January, 2023.

Garvey, S. M., P. H. Templer, E. A. Pierce, A. B. Reinmann, L. R. Hutyra. Diverging patterns at the forest edge: soil respiration dynamics of fragmented forests in urban and rural areas. *Global Change Biology*, 00, 1–16. https://doi.org/10.1111/gcb.16099. February, 2022. Media coverage: WBUR, The Brink.

Winbourne, J. B., T. S. Jones, **S. M. Garvey**, J. Harrison, L. Wang, D. Li, P. H. Templer, L. R. Hutyra. Tree transpiration and urban temperatures: current understanding, implications, and future research directions, *BioScience*, https://doi.org/10.1093/biosci/biaa055. June, 2020.

Dietterich, L. M., A. Li, **S. M. Garvey**, B. B. Casper. Aboveground competition and herbivory overpower plant-soil feedback contributions to succession in a remediated grassland. *Frontiers in Ecology and Environment*, https://doi.org/10.3389/fevo.2019.00459. November, 2019.