

Katherine A. Dynarski, Ph.D.

Research Soil Scientist

National Soil Survey Center, USDA-NRCS, Lincoln, NE, USA

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Research and Professional Experience

Research Soil Scientist, National Soil Survey Center, USDA-NRCS	2023-present
Soil Health Program Coordinator, Franklin County Natural Resources Conservation District, Vermont	2021-2023
Postdoctoral Research Associate, University of Montana	2020-2021
Postdoctoral Fellow, UC Davis	2018-2020
Part-Time Faculty, California State University Sacramento	2018
Graduate Teaching and Research Assistant, UC Davis	2013-2018
NSF Graduate Research Intern, Oregon State University	2017
Undergraduate Research Assistant, Villanova University	2009-2013

Education and Training

Villanova University Villanova, PA	Biochemistry	B.S. 2013
University of California – Davis Davis, CA	Soils & Biogeochemistry	Ph.D. 2018
University of California – Davis Davis, CA	Department of Land Air and Water Resources	Postdoc; 2018-2020
University of Montana Missoula, MT	Department of Ecosystem and Conservation Sciences	Postdoc; 2020-2021

Peer-Reviewed Publications

Dynarski, K.A.; Soper, F.M.; Reed, S.C.; Wieder, W.R.; Cleveland, C.C. Patterns and controls of foliar nutrient stoichiometry and flexibility across United States forests. *Ecology* (2023).

Ospina, M.C.; Turpin, J.M.; Murray, K.A.; Abusaa, S.T.; Jadallah, C.C.; Drwencke, A.M.; Pascoe, E.L.; Godwin, R.L.; Ellison, R.; **Dynarski, K.A.** On interrogating binaries and attending to power through feminist research methodologies in environmental education. *Qualitative Research for Diverse and Underserved Communities* (2023).

Cleveland, Cory C.; Reis, C.R.G.; Perakis, S.S.; **Dynarski, K.A.;** Batterman, S.A.; Crews, T.E.; Gai, M.; Gundale, M.J.; Menge, D.N.L; Peoples, M.B.; Reed, S.C.; Salmon, V.G.; Soper, F.M.; Taylor, B.N.; Turner, M.G.; Wurzbarger, N. Exploring the Role of Cryptic Nitrogen Fixers in Terrestrial Ecosystems: A Frontier in Nitrogen Cycling Research. *Ecosystems* (2022).

Rippner, D.A.; Margenot, A.J.; Aguilera, L.A.; Li, C.; Sohn, J.; **Dynarski, K.A.;** Waterhouse, H.; McElroy, M.; Wade, J.M.; Hind, S.R.; Green, P.G.; Peak, D.; McElrone, A.J.; Fakra, S.C.; Chen,

N.; Feng, R.; Scow, K.M.; Parikh, S.J. Microbial response to copper oxide nanoparticles in soils is controlled by land use rather than copper fate. *Environmental Science: Nano* (2021).

Soper, F.M.; Taylor, B.N.; Winbourne, J.B.; Wong, M.Y.; **Dynarski, K.A.**; Reis, C.R.G.; Peoples, M.B.; Cleveland, C.C.; Reed, S.C.; Menge, D.N.L.; Perakis, S.S. A roadmap for sampling and scaling nitrogen fixation in terrestrial ecosystems. *Methods in Ecology and Evolution* (2021).

Nayfach, S., Roux, S., Seshadri, R., Udworthy, D., Varghese, N., Schulz, F., Wu, D., Paez-Espino, D., Chen, I.-M., Huntemann, M., Palaniappan, K., Ladau, J., Mukherjee, S., Reddy, T. B. K., Nielsen, T., Kirton, E., Faria, J. P., Edirisinghe, J. N., Henry, C. S., **IMG/M Data Consortium (including K.A. Dynarski)**, Eloe-Fadrosh, E. A. (2020). A genomic catalog of Earth's microbiomes. *Nature Biotechnology*, 1–11.

Dynarski, K.A.; Pett-Ridge, J.C.; Perakis, S.S. Decadal-scale decoupling of soil phosphorus and molybdenum cycles by temperate nitrogen-fixing trees. *Biogeochemistry* (2020).

Dynarski, K.A.; Bossio, D.A.; Scow, K.M. Dynamic stability of soil carbon: reassessing the “permanence” of soil carbon. *Frontiers in Environmental Science* (2020).

Dynarski, K.A.; Houlton, B.Z. Isotopic constraints on plant nitrogen acquisition strategies during ecosystem retrogression. *Oecologia* (2020).

Dynarski, K.A.; Morford, S.L.; Mitchell, S.A.; Houlton, B.Z. Bedrock nitrogen weathering stimulates biological N fixation. *Ecology* (2019).

Dynarski, K.A.; Houlton, B.Z. Nutrient limitation of terrestrial free-living nitrogen fixation. *New Phytologist* (2017).

Vile, M.A.; Wieder, R.K.; Živković, T.; Scott, K.D.; Vitt, D.H.; Hartsock, J.A.; Iosue, C.L.; Quinn, J.C.; Petix, M.; Fillingim, H.M.; Popma, J.M.A.; **Dynarski, K.A.**; Jackman, T.; Albright, C.M.; Wyckoff, D.D. N₂-fixation by methanotrophs sustains carbon and nitrogen accumulation in pristine peatlands. *Biogeochemistry* (2014).

Manuscripts in Preparation or Review

Reis, C.R.G.; Perakis, S.S.; Cleveland, Cory C.; Menge, D.N.L.; Reed, S.C.; Taylor, B.N.; Batterman, S.A.; Clark, C.M.; Crews, T.E.; **Dynarski, K.A.**; Gai, M.; Gundale, M.J.; Herridge, D.F.; Jovan, S.E.; Kou-Griesbrecht, S.; Peoples, M.B.; Piipponen, K.; Rodriguez-Caballero, E.; Salmon, V.G.; Soper, F.M.; Staccone, A.P.; Weber, B.; Williams, C.A.; Wurzbarger, N. Global terrestrial biological nitrogen fixation and its modification by agriculture. *In preparation for Science* (2024).

Presentations

Invited Talks

- 2021 Asking better questions, telling better stories: communication tips for scientists. *Systems Ecology Seminar Series, University of Montana, Missoula, MT.*
- 2018 Bedrock Nitrogen, Microbes, and Soil Carbon. *Department of Environmental Studies Seminar Series, California State University Sacramento, Sacramento, CA.*
- 2018 Children and youth in climate change: an intergenerational perspective. *Global Climate Action Summit, San Francisco, CA.*
- 2018 The Future of Resource Management & Research in the Parks. *Sequoia & Kings Canyon Science Symposium, Three Rivers, CA.*

Contributed Talks

- 2024 Quantifying soil organic carbon stocks and soil health indicators in DSP4SH projects. *Pedometrics, Las Cruces, NM. [unable to present due to travel restrictions]*
- 2020 Community, collaboration, and care: Feminist methodologies for environmental education research. *North American Association for Environmental Education Annual Research Symposium.*
- 2017 Bedrock nitrogen influences ecosystem nitrogen cycling. *Goldschmidt Conference (Geochemical Society), Paris, France.*
- 2015 Bedrock nitrogen inputs support litter nitrogen fixation and temperate forest ecosystem fertility. *American Geophysical Union Fall Meeting, San Francisco, CA.*

Posters

- 2019 Dynamic stability: building soil carbon for soil health & climate change mitigation. *Soil Health Institute Annual Meeting, Sacramento, CA.*
- 2018 Engaging girls and non-binary youth in field-based science and leadership development through a free program in Sequoia National Park. *Sequoia & Kings*
- 2015 Role of bedrock nitrogen in regulating symbiotic nitrogen fixation and plant tissue chemistry. *Ecological Society of America Annual Meeting, Baltimore, MD.*
- 2013 Phosphorus limitation controls rates of biological N₂-fixation in boreal peatlands. *American Geophysical Union Fall Meeting. San Francisco, CA.*
- 2012 Nitrogen fixation in Sphagnum mosses in Canadian boreal peatlands: the role of molybdenum and phosphorous availability. *BIOGEOMON: 7th International Symposium on Ecosystem Behavior. Northport, ME.*

Awards & Fellowships

- 2020 Mass Media Science and Engineering Fellowship, American Association for the Advancement of Science & Ralph W.F. Hardy Endowment
- 2019 Distinguished Community Service Award, UC Davis Department of Land, Air & Water Resources
- 2014- 2017 Graduate Research Fellowship, National Science Foundation

Funding

- 2023 Large Education and Outreach Grant (Co-PI), Lake Champlain Basin Program, \$49,117
- 2022 Natural Resources Conservation Service Vermont Conservation Innovation Grant (Co-PI), \$263,00
- 2022 Technical Grant, *Developing Skills of TSPs to Assist Farmers with Soil Health Strategies* (co-PI), Lake Champlain Basin Program \$200,000
- 2021 Small Education Grant (co-PI), Lake Champlain Basin Program \$15,000
- 2018 Early Career Grant (awardee), National Geographic Society \$4,890
- 2018 Community Action Grant (awardee), American Association of University Women \$4,900
- 2017 National Science Foundation Graduate Research Internship Program (GRIP) \$5,000
- 2016 Joint Genome Institute Community Science Program Small Sequencing Grant
- 2014- 2016 UC Davis Henry A. Jastro Graduate Research Award \$7,247

Teaching

Courses Organized

- 2023 Soil Health Training Program for Vermont and New York Agricultural Service Providers, *Franklin County Natural Resources Conservation District*
- 2021 Nutrient Cycles in Earth System Models – Challenges, opportunities, and frontiers, remote seminar series with ~100 global participants, *University of Montana*

Instructor of Record

- 2018 Field Methods in Environmental Science, *California State University Sacramento*

Teaching Assistantships

- 2016 Global Environmental Interactions (lead TA), *UC Davis*
- 2015 Global Environmental Interactions, *UC Davis*

Invited Guest Lectures

- 2018, '19 "Introduction to Soils," Global Environmental Interactions, *UC Davis*
- 2017, '19 "Introduction to Meta-Analysis," Ecosystem Biogeochemistry (graduate course), *UC Davis*

2019 “Microbial Biogeochemistry,” Ecosystem Biogeochemistry (graduate course),
UC Davis

Undergraduate Research Mentorship

Angel Fong, Emma Hansen-Smith, and Joyce Wong. UC Davis. 2016-2017.

Project title: “Heavy Metal Sequestration by Douglas Firs on Serpentine Soil”

Christina Day, Andy Parks, Elisa Fernandes-McDade, Emma Hansen-Smith, Sara Hutton, Avery Kruger, and Kelly Norris (participants in Strategies for Ecological Education, Diversity, and Sustainability [SEEDS] program at UC Davis). 2014-2015.

Project title: “Mycorrhizal Enzyme Activity in the Pygmy Forest”

Mentor in Ecology and Evolutionary Biology Mentor Match Program, 2020-2021

Public Outreach

Girls Outdoor Adventure Leadership in Science (GOALS) UC Davis Chapter, 2017-2019

- Co-founder, 2017-2018/2018-2019 program chair
- Collaborated on a team of graduate students and early career scientists to design, fundraise, and implement a free immersive science education summer program for high school girls from backgrounds underrepresented in STEM
- Developed curriculum for teaching environmental science in a wilderness setting
- Established a novel collaboration between UC Davis and Sequoia and Kings Canyon National Parks

Science Informed Leadership (now a part of the Union of Concerned Scientists Science Network), 2016

- Co-founder and 2016 messaging director
- Worked with a team of graduate students to promote scientific advocacy at a state and national political level through an op-ed writing and letter writing campaign
- Co-wrote articles appearing on blogs of the Union of Concerned Scientists, Scientific American, and the Ecological Society of America

Ecological Science Educator/Facilitator, Insight Garden Program, Solano State Prison, 2014-2017

- Taught ecological principles and their applicability to both successfully growing a garden and developing healthy life skills in a weekly class for inmates at Solano State Prison

Ecological Restoration Mentor, Student & Landowner Education & Watershed Stewardship Program, 2013-2018

- Taught high school students about ecological principles, provided college and career mentorship, and supervised student participation in riparian zone restoration field days

Selected Outreach Presentations and Publications

- Rain Garden Planning and Green Infrastructure. Franklin County Stormwater Winter Water Workshop Series 2023. <https://vimeo.com/811315270>

- Gardening for Water Quality. Franklin County Stormwater Winter Water Workshop Series 2022. <https://vimeo.com/666073349>
- “Preventing Over-Fertilization for Better Crop Quality and Yield” – Teralytic Blog, December 2018. <https://blog.teralytic.com/preventing-over-fertilization/>
- “How Microbes Make Soils – and Crops – Healthier” – Teralytic Blog, November 2018. <https://blog.teralytic.com/soil-microbes/>
- “Graduate Students Organize to Promote Science-Informed Leadership in the New Executive Administration” – Union of Concerned Scientists Blog, December 2016. <https://blog.ucsusa.org/science-blogger/graduate-students-organize-to-promote-science-informed-leadership-in-the-new-executive-administration>

Academic Service

Working Groups

John Wesley Powell Center for Analysis and Synthesis Working Group: “Global Terrestrial Synthesis of Biological Nitrogen Fixation” (January 2020-present)

Journals Reviewed For

Ecology, Functional Ecology, Biogeochemistry, Global Biogeochemical Cycles, Plant & Soil, Proceedings of the National Academy of Sciences, PeerJ, Agronomy Journal, Global Change Biology, Biotropica, PLoS ONE, Journal of Ecology, Journal of Geophysical Research – Biogeosciences, Science of the Total Environment, Soil Biology & Biochemistry, Scientific Reports, Nature Communications, Global Ecology and Biogeography, New Phytologist, Frontiers in Ecology and the Environment

Workshops Organized

NSF-GRFP Application Workshop, UC Davis, September 2014

“Genome Detectives” Workshop at Expanding Your Horizons UC Berkeley (invited workshop), 2014-2018

Committees Served On

UC Davis Soils & Biogeochemistry Graduate Group Seminar Committee (2017-2018)

UC Davis Graduate Student Association - Soils & Biogeochemistry Representative (2014-2016)

Professional Development

Workshops Attended

School of Advanced Science on nitrogen cycling, environmental sustainability and climate change, organized by University of São Paulo Center of Nuclear Energy in Agriculture (USP-CENA) and the Inter-American Institute for Global Change Research (IAI), São Pedro, São Paulo, Brazil. July 31-August 10 2016.

NSF NEON: Mapping species, composition (foliar chemistry) and soil properties with spectroscopy, organized by Boise Center Aerospace Laboratory, Boise State University. Boise, ID. August 29-31 2016.

NSF NEON: Topographic, Geomorphic, and Vegetation Analysis with Lidar, organized by Boise Center Aerospace Laboratory, Boise State University. Boise, ID. September 28-30 2016.