Dr. Katherine A. Dynarski

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Education & Training

2020 – present **Postdoctoral Research Associate**
University of Montana
Advisor: Cory C. Cleveland

2018 – 2020 **Postdoctoral Scholar**
University of California, Davis & The Nature Conservancy
Advisors: Kate M. Scow (UCD) and Deborah A. Bossio (TNC)

2013 – 2018 **Ph.D., Soils & Biogeochemistry**
University of California, Davis
Advisor: Benjamin Z. Houlton

2009 – 2013 **B.S., Biochemistry**
Villanova University

Publications

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., Udwary, 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.; Wykoff, D.D. N_2-fixation by methanotrophs sustains carbon and nitrogen accumulation in pristine peatlands. *Biogeochemistry* (2014).

Manuscripts in Preparation and Review

Cleveland, C.C.; **Dynarski, K.A.;** Batterman, S.; Crews, T.E.; Gei, M.; Gundale, M.J.; Menge, D.N.L.; Peoples, M.P.; Reed, S.C.; Reis, C.R.G.; Salmon, V.G.; Soper, F.M.; Taylor, B.N.; Turner, M.G.; Wurzburger, N.; Perakis, S.S. Cryptic nitrogen fixers: An important frontier in terrestrial N cycling research. *Biogeochemistry* (in prep).

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* (in review).

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* (in review).

Presentations

Invited Talks

2021 Asking better questions, telling better stories. *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

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 asymbiotic 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

2018 **Early Career Grant, National Geographic Society** $4,890

2018 **Community Action Grant, 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

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, provides college and career mentorship, and supervises student participation in riparian zone restoration field days

Selected Outreach Presentations and Publications

- "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

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 Paolo, 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.