
JANE M. LUCAS, PhD

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Research Interests:

Microbial ecology, Ecology of antibiotics, Agricultural ecosystems and soil health, Global change ecology, Ecology of microbiomes, Plant-insect-microbe interactions, Bioinformatics and multi-omics techniques

Professional Appointments

2021-Present Assistant Scientist, Cary Institute of Ecosystem Studies, Millbrook, New York
2020-2021 USDA Postdoctoral Fellow, University of Idaho, Department of Soil and Water Systems, Moscow, Idaho
2020-2021 COVID-19 Diagnostic Lab Technician and Competency Officer at Gritman Medical Center, Moscow, Idaho
2018-2020 Postdoctoral Fellow, Advisor: Dr. Michael Strickland, University of Idaho, Department of Soil and Water Systems, Moscow, Idaho
2013-2018 Graduate Researcher, Advisor: Dr. Michael Kaspari, University of Oklahoma, Department of Biology, Norman, OK
2017 Graduate Researcher, Advisor: Dr. Tomas Roslin, University of Helsinki, Spatial Food Web Ecology, Helsinki, Finland.
2016 Graduate Researcher, Advisor: Dr. Alfonso Alonso, Smithsonian Center for Conservation and Sustainability, Washington D.C.
2015 Smithsonian Tropical Research Institute Fellow, Advisor: Dr. William Wcislo, Barro Colorado Island, Panama
2011 Undergraduate Researcher, Global Health Course by the Organization for Tropical Studies, Costa Rica
2009-2018 Field Researcher, Barro Colorado Island, Panama
2008-2013 Research Assistant, Advisor: Dr. Adam Kay, University of St. Thomas, Department of Biology, St. Paul, MN

Education

University of Oklahoma, Norman, OK

Doctorate of Philosophy in Ecology and Evolutionary Biology, May 2018

Dissertation: From Cooperation to Competition: How microbes and invertebrates interact in a tropical forest, Advisor: Michael Kaspari

University of St. Thomas, St. Paul, MN

Bachelor of Arts in Biology, Minor in Justice and Peace Studies, May 2012

Organization for Tropical Studies, Costa Rica

Fellowships, Scholarships, Awards, and Grants (Total: \$433,638)

Awarded:

- 2021 Best Postdoctoral Presentation, SoilCon: Washington Soil Health Week.
- 2020 USDA AFRI Postdoctoral Fellowship (\$160,000) *How agricultural antibiotics and manure interact to shape soil communities, ecosystem function and environmental antibiotic resistance* Principle Investigator
- 2019 Best Postdoctoral Poster Presentation, Center for Health and Human Systems
- 2019 Ecological Society of America Microbial Ecology Travel Grant, \$500
- 2017 National Science Foundation Doctoral Dissertation Improvement Grant (DDIG), \$16,138
- 2017 National Science Foundation Graduate Research Opportunities Worldwide (GROW), \$5000
- 2017 University of Oklahoma Bullard Research Grant, \$1000
- 2016 National Science Foundation Graduate Research Internship Program (GRIP), \$5000
- 2015 Smithsonian Tropical Research Institute Short Term Fellowship, \$2500
- 2014 University of Oklahoma Hill Research Grant, \$500
- 2014 National Science Foundation Graduate Research Fellowship Program (GRFP), \$138,000
- 2014 University of Oklahoma Adams Graduate Scholarship, \$2,500
- 2013 Graduate Assistance in Areas of National Need Fellowship (GAANN), \$102,000
- 2012 University of St. Thomas Travel Grant, \$500
- 2012 Best Talk in Session Minnesota Academy of Science Undergraduate Research Symposium
- 2012 Presidential prize best undergraduate talk, The Entomological Society of America meeting

Not Funded:

- 2019 DOE Department of Biological and Environmental Research (\$963,747) *Do hurricane-derived micronutrients and flooding interact to affect ecosystem processes at the plant-soil interface? A test in coastal grasslands.* Lead Author, Invited for full proposal
- 2018 L'Oreal Women in Science Fellowship (\$60,000) *The Influence of Antibiotic Compounds on Soil Microbial and Invertebrate Communities.* Principle Investigator.
- 2020 NSF Ecosystem Science Cluster Proposal (\$963,747) Collaborative Proposal *Do hurricane-derived micronutrients and flooding interact to affect ecosystem processes at the plant-soil interface? A test in coastal grasslands.* Lead Author and Co-PI

Under Review

- 2020 Western SARE Research & Education Full Proposal (\$17,272) *One or many? Impacts of single- versus multi-species rotational grazing strategies on forage production, soil health, and microbiome dynamics.* Co-PI

Publications

16. Naveen J., **J.M. Lucas**, N. Vishwanath, R. Findlay, J. Sprinkle, M.S. Strickland, E. Winford. (2021) Investigation of relationships between fecal contamination, cattle grazing, human recreation, and microbial source tracking markers in a mixed-land-use rangeland watershed. *Water Research*.
15. **Lucas, J.M.**, J. Jonas-Bratten, A.N. Laws, D.H. Branson, S.C. Pennings, C.M. Prather, and

- M.S. Strickland. (2021) Herbivore functional groups, not species, shape belowground communities, but not their function. *Functional Ecology*.
14. **Lucas, J.M.***, McBride, S.* , M. Strickland. (2020) Trophic structure mediates soil microbial community composition and function. *Soil Biology and Biochemistry*. *Author's contributed equally
 13. Wepking, C., B. Badgley, J. Barrett, K. Knowlton, K. Minick, P. Ray, **J.M. Lucas**, S. Shawver, M. Strickland. (2019) Exposure to antibiotics alters microbial communities and terrestrial elemental cycling. *Ecology Letters*.
 12. Danielsson, R.J., **J.M. Lucas**, J. Dahlberg, M. Ramin, S. Agenas, I. Tapio, A. Bayat, T. Hammer and T. Roslin. (2019) Context-dependence of antibiotic effects on methane emissions from livestock. *Royal Society Open Science*.
 11. **Lucas, J.M.**, E.M. Gora, A. Salzberg[†], and M. Kaspari. (2019) Antibiotics as chemical warfare across multiple taxonomic domains and trophic levels. *Proc R Soc B*.
 10. Gora, E.M. and **J.M. Lucas**. (2019) Dispersal and nutrient limitations of canopy-level decomposition: evidence from experimental manipulations of epiphytes and macronutrients. *Functional ecology*.
 9. **Lucas, J.M.**, A.A. Madden, C.A. Penick, M.J. Epps, P.R. Marting, J.L. Stevens, D.J. Fergus, R.R. Dunn, E.K. Meineke. (2019) Ants control insect pathogens, but not plant pathogens, inside their nests in a model ant-plant mutualism. *Proc. R. Soc. B*.
 8. Gora, E.M., **J.M. Lucas**, and S.P. Yanoviak. (2019) Microbial composition and decomposition rates vary with environmental conditions from the ground to the canopy in a tropical forest. *Ecosystems*.
 7. **Lucas, J.M.**, N.A. Clay, and M. Kaspari. (2018) External myrmecotrophy benefits host plants of dominant canopy ant, *Azteca trigona*. *Ecological Entomology*.
 6. **Lucas, J.M.**, E.M. Gora, and A. Alonso. (2017) A view of the global conservation job market and how to succeed in it. *Conservation Biology*. *Top 20 downloaded of 2017-18
 5. **Lucas, J.M.**, B. Bill, B. Stevenson, M. Kaspari. (2016) The microbiome of the ant-built home: the microbial communities of a tropical arboreal ant and its nest. *Ecosphere*.
 4. Kaspari M., N.A. Clay, **J.M. Lucas**, S. Revzen, A.D. Kay, and S.P. Yanoviak. (2015) Thermal adaptation and phosphorus shape thermal performance in an assemblage of rainforest ants. *Ecology*.
 3. Kaspari M., N.A. Clay, **J.M. Lucas**, S.P. Yanoviak, and A.D. Kay. (2014) Thermal adaptation generates a diversity of thermal limits in a rainforest ant community. *Global Change Biology*.
 2. Clay, N.A., **J.M. Lucas**, M. Kaspari and A.D. Kay. (2013) Manna from heaven: Refuse from an arboreal ant connects aboveground and belowground processes in a lowland tropical forest. *Ecosphere*.
 1. Kaspari M., D. Donoso, **J.M. Lucas**, T. Zumbusch and A.D. Kay. (2013) Using nutritional ecology to predict community structure: field test in Neotropical ants. *Ecosphere*.

[†]Denotes Student Mentee Co-Author

Currently under review

Lucas, J.M., B. Sone[†], D. Whitmore[†]. M.S. Strickland. Antibiotics and temperature interact to disrupt soil communities and their function. *In review*.

In the final stages of preparation

- Wepking, C., **J.M. Lucas**, V. Boulos, M.S. Strickland. Antibiotics affect the thermal response of soil microbial communities. *In prep.*
- Lucas, J.M.**, B. Sone[†], M.S. Strickland. Antibiotics and temperature interact to disrupt soil communities and their function. *In prep.*
- Lucas, J.M.**, H. Nunn, and M. Kaspari. Detritivorous invertebrates avoid harmful antibiotic compounds to increase survival rates. *In prep.*

Invited and Select Presentations

- Lucas, J.M.** and E. Gora. 2021. How to deliver successful online presentations. 2-Day presentation and workshop, Smithsonian Tropical Research Institute. Panama.
- Lucas, J.M.**, B. Sone[†], D. Whitmore, M.S. Strickland. 2021. Antibiotics and temperature interact to disrupt soil communities and their function. Canadian Soil Science Society Meeting.
- Lucas, J.M.** and M. Strickland. 2021. Novel molecular techniques for understanding soil health. SoilCon: Washington State Soil Health Week, Pullman, WA.
- Lucas, J.M.** 2020. Exploring the ecology of antibiotics. Inspire session, Ecological Society of America Meeting, Virtual.
- Lucas, J.M.** 2020. Superbugs to superorganisms: the ecology of microbes, invertebrates and antibiotics. Iowa State University, Ames, IA.
- Lucas, J.M.** 2020. Superbugs to superorganisms: the ecology of microbes, invertebrates and antibiotics. University of Massachusetts, Amherst, MA.
- Lucas, J.M.** 2020. Superbugs to superorganisms: the ecology of microbes, invertebrates and antibiotics. University of Illinois, Urbana-Champaign, IL.
- Lucas, J.M.** 2020. Social media training for scientists. Institute for Modeling Complex Interactions. University of Idaho, Moscow, ID.
- Lucas, J.M.** and M. Strickland. 2019. Antibiotics and temperature disrupt soil communities and their function. British Ecological Society Meeting, Belfast, Ireland.
- Lucas, J.M.** 2019. Superbugs to superorganisms: the ecology of microbes, invertebrates and antibiotics. The Cary Institute, Millbrook, NY.
- Lucas, J.M.** and M. Strickland. 2019. Antibiotics and temperature disrupt soil communities and their function. Poster presentation at the EPSCoR Annual Meeting, Columbia, SC.
- Lucas, J.M.** and M. Strickland. 2019. Antibiotics and temperature disrupt soil communities and their function. Poster Presentation at the University of Idaho's Center for Health in Humans Systems Symposia, Moscow, ID.
- Lucas, J.M.** 2019. Ecosystem Health in the age of antibiotics. Invited lecture for Science on the Palouse Series. Colfax County Library, Colfax, WA.
- Lucas, J.M.** and M. Kaspari. 2019. Competition inside and out: Examining the relationship between microbiomes and free-living microbes. Invited talk in Organized Oral Session: Inside Inverts: Using Microbiomes of Non-Model Invertebrates to Test Ecological Theory. Ecology Society of American, Louisville, KY.
- Lucas, J.M.** and M. Strickland. 2019. Antibiotics and temperature disrupt native Palouse soil communities and their function. Poster presentation at the Multi-Omics for Microbiomes Conference at PNNL, Richland, WA.
- Lucas, J.M.** and M. Strickland. 2019. Antibiotics and temperature disrupt soil food webs and their function. Soil Ecology Society Meeting, Toledo, OH.

- Lucas, J.M.**, A.A. Madden, C.A. Penick, M.J. Epps, P.R. Marting, J.L. Stevens, D.J. Fergus, R.R. Dunn, E.K. Meineke. 2019. The microbial ecology of ant nests. UI Research Computing and Data Science Symposium, Moscow, ID.
- Lucas, J.M.*** 2018. The little things that run the world: How microbes and invertebrates interact and shape our ecosystems. Institute for Bioinformatics and Evolutionary Studies Lightning Talk, Moscow, ID.
- Lucas, J.M.** 2018. From microbial communities to ecosystem processes: How antibiotics and herbivores shape soil and human health. Integrative Research and Innovation Center's Lunch and Learn presentation, Moscow, ID.
- Lucas, J.M.** and Kaspari, M. Antimicrobials as chemical warfare against detritivorous invertebrates. 2018 meeting of the Ecological Society of America, New Orleans, LA.
- Lucas, J.M.** From cooperation to competition: How microbes and invertebrates interact in a tropical forest. 2018. Dissertation Defense Seminar, University of Oklahoma.
- Lucas, J.M.** and Kaspari, M. The role of antibiotics in the decomposer food web. 2017 meeting of the Ecological Society of America, Portland, OR.
- Lucas, J.M.*** How anthropogenic introductions of antibiotic compounds impact our ecosystems. 2017. University of Helsinki, Helsinki, Finland.
- Lucas, J.M.*** Exploring the impact of *Azteca trigona* in a Neotropical Forest. 2017. University of Louisville: Biology Departmental Presentation, Louisville, KY.
- Henderson, K.[†], M. Kaspari, **J.M. Lucas**. *Azteca trigona* influence species distribution and ant behavior in a lowland tropical forest. 2017 National Conference for Undergraduate Research. University of Memphis, Memphis, Tennessee.
- Lucas, J.M.** The role of antibiotics in tropical forests. 2017. EEB Presentation. University of Oklahoma, Norman, Oklahoma.
- Lucas, J.M.** The impact of antibiotics in Panama's tropical forests. 2016. STRI Microbial Symposium Oral Presentation. Smithsonian Tropical Research Institute, Panama.
- Lucas, J.M.** Patterns of bacterial community composition and nutrient content across *Azteca trigona* ants, their nest, refuse and surrounding soil. 2016 meeting of the Ecological Society of America, Fort Lauderdale, FL.
- Lucas, J.M.***. The microbiome of the ant-built home. 2016. OTS Guest Lecture. Barro Colorado Island, Panama.
- Lucas, J.M.** The microbiome of the ant-built home. 2016. Bambi Presentation. Barro Colorado Island, Panama.
- Lucas, J.M.***. One ant's trash is another plant's treasure: How *Azteca trigona* connects above and belowground ecosystems. 2016. Smithsonian Center for Conservation and Sustainability Presentation, Washington, D.C.
- Lucas, J.M.** Bridging Science and Film: the scientific perspective. 2016. Guest Lecturer. American University Environmental Film Making Course, Washington, D.C. *Invited*.
- Lucas, J.M.**, M. Kaspari, The Power of *Azteca*: How the canopy ant *A. trigona* influences plant growth in a wet tropical forest. 2015 Entomological Society of America, Minneapolis, MN.
- Lucas, J.M.** One ant's trash is another plant's treasure: How *Azteca trigona* connects above and belowground ecosystems. 2015. Ecomunch Presentation. Norman, Oklahoma.
- Lucas, J.M.** One ant's trash is another plant's treasure: How *Azteca trigona* connects above and belowground ecosystems. 2015. OTS Guest Lecture. Barro Colorado Island, Panama.
- Kaspari, M., N.A. Clay, S.P. Yanoviak, S. Revzen, J. Czekanski-Moir, **J.M. Lucas**, A.D. Kay.

On the evolution of ant thermal performance: clues from a Neotropical forest. 2013 Society of Integrative and Comparative Biology meeting. San Francisco, CA.

Lucas, J.M., N.A. Clay, M.E. Kaspari, A.D. Kay. Refuse from an arboreal ant connects aboveground and belowground processes in a lowland tropical forest. 2012 meeting of the Ecological Society of America, Austin, TX.

Lucas, J.M., N.A. Clay, M.E. Kaspari, A.D. Kay. *Azteca* ants connect aboveground and belowground processes in a wet tropical forest. 2012 meeting of the Entomological Society of America, Knoxville, TN.

* *Invited*, † *Undergraduate mentee*

Teaching Experience

Courses Taught

- 2019 **Co-Instructor**, Microbial Ecology
 University of Idaho, Moscow, ID
- 2017 **Course Designer and Teaching Assistant**, Principles of Ecology
 University of Oklahoma, Norman, OK
- 2015 **Teaching Assistant**, Molecular and Organismal Biology 1134
 University of Oklahoma, Norman, OK
- 2012 **Invited CHANCE Instructor**, Barro Colorado Island
 Penn State University

Guest Lectures

- 2019 Invited Guest Lecturer, Soil Microbiology
 Washington State University, Pullman, WA
- 2018 Regional Approaches to Climate Change (REACCH) Internship Guest Lecturer
 University of Idaho, Moscow, ID
- 2016 Invited Guest Presenter, Barro Colorado Island
 OTS Graduate Student Field Ecology Course
- 2015 Invited Guest Presenter, Barro Colorado Island
 OTS Graduate Student Field Ecology Course

Teacher Training

2013-2014 Graduate Teaching Academy Level 1, Center for Teaching Excellence

Program Description: Graduate Teaching Academy (GTA) seeks to promote and maintain a standard of teaching excellence amongst graduate students at the University of Oklahoma. Through this program you will improve your teaching effectiveness and professional development through discussion-based interactions focused on the theory and philosophy of teaching. It will prepare you for your teaching career through outcome-based workshops and practice sessions focused on the application of teaching principles and professional development strategies. Finally, you will explore relevant teaching topics through learning communities examining in-depth, teaching-related topics.

Example Graduate Teaching Academy Seminars

What to do About Negative Course Evaluations

Creating Collaborative Student Groups

Using Classroom Polling to Facilitate Student Interaction
Creating a Safe and Engaging Discussion Space
Teaching and Working with International Students
Building and Using Rubrics to Ensure Fairness in Subjective Grading

Mentoring Experience

2020 Mentor for University of Idaho Lab Technician, Dana Whitmore
University of Idaho, Moscow, ID

2019-20 Mentor for University of Idaho Undergraduate Researcher, Katelyn Conery
University of Idaho, Moscow, ID

2019-20 Committee Member for University of Idaho Doctoral Student, Bronte Sone
University of Idaho, Moscow, ID

2019-20 Mentor for University of Idaho Doctoral Student, Dan Nu
University of Idaho, Moscow, ID

2019-20 Mentor for University of Idaho Undergraduate Researcher, Caitlin Mullaly
University of Idaho, Moscow, ID

2018-20 Mentor for Virginia Tech PhD Student, Steven McBride
Virginia Tech, Blacksburg, VA

2018-19 Mentor for University of Idaho Undergraduate Researcher, Luke Hester
University of Idaho, Moscow, ID

2018-19 Mentor for University of Idaho Undergraduate Researcher, Emi Smith
University of Idaho, Moscow, ID

2018-19 Mentor for University of Idaho Masters Student, Peter Hoch
University of Idaho, Moscow, ID

2018 Regional Approaches to Climate Change (REACCH) Internship Mentor, Lola Klam
University of Idaho, Moscow, ID

2017 REU Mentor, Barro Colorado Island, Riley Kneale
Smithsonian Tropical Research Institute, Panama

2016 REU Mentor, Barro Colorado Island, Kate Henderson
Smithsonian Tropical Research Institute, Panama

2016 REU Mentor, Barro Colorado Island, Annika Salzberg
Smithsonian Tropical Research Institute, Panama

2015 REU Mentor, Barro Colorado Island, Carolyn Gigot
Smithsonian Tropical Research Institute, Panama

2014 REU Mentor, Barro Colorado Island, Megan Silvers
Smithsonian Tropical Research Institute, Panama

Scholarly Service and Outreach

2020 Postdoctoral Representative for Provost and Executive Vice President Search
University of Idaho, Moscow, Idaho

2019-20 Postdoctoral Representative for the R1 Research University Task Force Team
University of Idaho, Moscow, Idaho

2020 What do you do for work? Job Exposure Presentation to 3rd Grade Class
Moscow Charter School, Moscow, Idaho

- 2020 Science on Ice Outreach Scientist
Palouse Ice Rink, Moscow, Idaho
- 2019 Science on Ice Outreach Scientist
Palouse Ice Rink, Moscow, Idaho
- 2019 Module instructor & visiting scientist designing a middle school “Garden Classroom”
Palouse Prairie Charter School, Moscow, ID
- 2019 Rendezvous for Kids Introduction to Coding and Engineering
Rendezvous in the Park, Moscow, Idaho
- 2019 CALS Summer of Science Healthy Soils Exploration Day
Moscow Farmer’s Market, Moscow, Idaho
- 2019 Fernwood Elementary soil erosion outreach experiment
University of Idaho, Moscow, Idaho
- 2019 Speeding Up Science hackathon for compiling reproducible bioinformatics workflows
University of California, Davis, California
- 2019 Science After Hours Guest Lecture on Ecosystems in the Age of Antibiotics
Palouse Clearwater Educational Institute, Moscow, Idaho
- 2019 Science on Ice Outreach Scientist
Palouse Ice Rink, Moscow, Idaho
- 2019 Guest on Musings on Microbial Management Podcast
University of Idaho, Moscow, Idaho
- 2018 Guide to navigating graduate school student workshop
University of Idaho, Moscow, Idaho
- 2018 Guide to gaining essential skills in graduate school round table
University of Pittsburgh
- 2017 Guest lecture on alternative careers in conservation biology
University of Oklahoma, Ecology and Evolutionary Biology
- 2017 Guide to grant writing in graduate school guest lecture
University of Oklahoma, Ecology and Evolutionary Biology
- 2016 Guided tour of Barro Colorado Island for OTS Course
Barro Colorado Island, Panama
- 2015 Guided tour of Barro Colorado Island for visiting researchers
Barro Colorado Island, Panama
- 2015 Madill High School field day at OUBS
University of Oklahoma Biological Station, OK
- 2014 Madill High School field day at OUBS
University of Oklahoma Biological Station, OK
- 2012 Cretin-Durham Introduction to Research Class
Cretin-Durham High School, St Paul, MN
- 2012 St Thomas Moore Insect Day
St Thomas More Catholic School, St Paul, MN
- 2012 Groveland Park Insect Day
Guest instructor, Groveland Park Academy, St Paul, MN
- 2012 Dowling Elementary School Insect Day
Guest instructor Dowling Elementary, St Paul, MN

Selected Press

Life on the Range: “Mink Creek Water Quality: An E. Coli Mystery Solved with DNA”

Progressive Forage: “Soil altered by livestock antibiotics”
Scientific America: “Manure Problems: Antibiotic use in cows alters carbon cycling”
Inland 360: “What soil tells scientists about the rise of antibiotic resistant drugs”
NCState News: “For at least on species, ant nurseries are cleaner than human ones”
SciNews: “Nurseries of *Azteca* ants are cleaner than human ones”
Mongabay: “Not all doom and gloom’: Q&A with conservation job market researchers”
Smithsonian Channel: “Secrets of the Rainforest” Video Segment
Smithsonian Channel: “Mysteries of the Rainforest” Video Segment
Smithsonian Channel: “10 Tons of Ant Poop Keeps This Rainforest Thriving” Video Segment

Reviewer

ISME Journal, PLoS One, Ecological Entomology, Ecology, Ecosphere, Science of the Total Environment, Journal of Animal Ecology, Pedobiologia, Biotropica, Frontiers in Ecology and the Environment, Journal of Ecology, Microbial Ecology, Forest Ecology and Management, Journal of Dairy Science, Geoderma, Biogeosciences, Basic and Applied Ecology, Animal Microbiomes

Professional Society Memberships

Soil Ecology Society
Ecological Society of America (ESA) -- Sections: *Microbial Ecology, Soil Ecology*
Entomological Society of America (ESA)
British Ecological Society (BES)
Graduate Women in Science (GWIS)
Randall Women in Science: Inclusion, Diversity, Equality Alliance
National Postdoctoral Association
500 Women Scientists
University of Idaho Postdoctoral Association – *Co-President*

Select Professional Training

2019 Teaching to a diverse audience, Project Biodiversify
2019 Improv-ing Your Life – Essential Skills for Any Career, National Postdoctoral Society
2019 NSF Postdoctoral Research Fellowships: Strategies for Success, Nat. Postdoc. Society
2018 Building an inclusive mentoring program, Randal Women in Science, Univ. of Idaho
2016 American University Environmental Film Making Course
2013 Graduate Teaching Academy Level 1, Center for Teaching Excellence