

SARAH E. EVANS, PHD

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APPOINTMENTS

- 2014 – *Assistant Professor*, Kellogg Biological Station, Department of Integrative Biology,
Department of Microbiology & Molecular Genetics, Michigan State University
- 2012 – 2014 *NSF Postdoctoral Fellow*, University of California-Irvine, Irvine, CA
Advisors: Steven Allison (UC Irvine) & Kiona Ogle (Arizona State University)
- 2009 – 2012 *NSF Graduate Research Fellow*, Colorado State University

EDUCATION

- 2007 – 2012 *PhD, Ecology*. Colorado State University, Fort Collins, CO
Advisors: Matthew Wallenstein and Ingrid Burke (U Wyoming)
- 2001 – 2005 *BA, Biology*. Grinnell College, Grinnell, IA
Advisors: Kathryn and Peter Jacobson. Outside coursework: OTS semester in Costa Rica/Nicaragua, Juneau Icefield Research Program, Juneau, Alaska/Atlin, BC

PUBLICATIONS

- Evans, SE**, J. Martiny, S. Allison. 2016. Effects of dispersal and selection on stochastic assembly in microbial communities. *International Society for Microbial Ecology Journal (ISMEJ)*. doi:10.1038/ismej.2016.96
- Evans, SE**, U Dieckmann, O Franklin, K Kaiser. 2015. Synergistic effects of diffusion and microbial physiology reproduce the Birch effect in a micro-scale model. *Soil Biology and Biochemistry* **93**: 28-37. doi: 10.1016/j.soilbio.2015.10.020
- Jacobson K, van Diepeningen A, **Evans SE**, Fritts R, Gemmel, P. Marsho C, Seely, M, Wenndt A, Yang X, Jacobson P. 2015. Non-rainfall moisture activates fungal decomposition of surface litter in the Namib Sand Sea. *PLoS ONE* **10**: e0126977. doi:10.1371/journal.pone.0126977
- Rocca, JD, EK Hall, JT Lennon, **SE Evans**, MP Waldrop, JB Cotner, DR Nemergut, EB Graham, MD Wallenstein. 2015. Relationships between protein-encoding gene abundance and corresponding process are commonly assumed yet rarely observed. *International Society for Microbial Ecology Journal (ISMEJ)* **9**: 1693-1699. doi:10.1038/ismej.2014.252
- Evans, SE** and MD Wallenstein. 2014. Climate change alters the ecological strategies of soil bacteria. *Ecology Letters* **17**: 155-164. doi: 10.1111/ele.12206

Evans, SE, MD Wallenstein, IC Burke. 2014. Is bacterial moisture niche a good predictor of shifts in community composition under long-term drought? *Ecology* **95**: 110-122. <http://dx.doi.org/10.1890/13-0500.1>

Evans, SE and IC Burke. 2013. Carbon and nitrogen decoupling under an 11-year drought in the shortgrass steppe. *Ecosystems* **16**: 20-23. doi: 10.1007/s10021-012-9593-4

Evans, SE and MD Wallenstein. 2012. Soil microbial community response to drying and rewetting stress: does historical precipitation regime matter? *Biogeochemistry* **109**:101-116. doi: 10.1007/s10533-011-9638-3

Conant, RT, MG Ryan, GI Ågren, HE Birge, EA Davidson, PE Eliasson, **SE Evans**, SD Frey, CP Giardina, F Hopkins, R Hyvönen, MUF Kirschbaum, JM Lavelle, J Leifeld, WJ Parton, JM Steinweg, MD Wallenstein, JÅ Martin Wetterstedt, and MA Bradford. 2011. Temperature and soil organic matter decomposition rates – synthesis of current knowledge and a way forward. *Global Change Biology* **17**: 3392–3404. doi: 10.1111/j.1365-2486.2011.02496.x

Evans, SE , KM Byrne, IC Burke and WK Lauenroth. 2011. Defining the limit to resistance in a drought tolerant grassland: long-term severe drought significantly reduces the dominant species and increases ruderals. *Journal of Ecology* **99**: 1500-1507. doi: 10.1111/j.1365-2745.2011.01864.x. *Received Issue 6 (November 2011) Editor's Choice Award

Evans, SE, IC Burke, WK Lauenroth. 2011. Controls on soil organic carbon and nitrogen in Inner Mongolia, China: a cross-continental comparison of temperate grasslands. *Global Biogeochemical Cycles* **25**: GB3006. doi:10.1029/2010GB003945

Submitted:

Wilcox, K, Z Shi, L Gherardi, NP Lemoine, SE Koerner, DL Hoover, E Bork, K Byrne, J Cahill, S Collins, **SE Evans**, AK Gilgen, P Holub, L Jiang, A Knapp, L Yahdjian, DR LeCain, J Liang, J Peñuelas, W Pockman, M Smith. Asymmetric responses of primary productivity to climate extremes: a synthesis of grassland precipitation manipulations. *Global Change Biology*

Hall, EK, ES Bernhardt, R Bier, MA Bradford, CM Boot, JB Cotner, PA del Giorgio, **SE Evans**, EB Graham, SE Jones, JT Lennon, D Nemergut, B Osborne, JD Rocca, JS Schimel, MS Waldrop, MD Wallenstein. Understanding How Microbiomes Influence the Systems they Inhabit: Insight from Ecosystem Ecology. *Nature Reviews Microbiology*. Pre-print: <http://dx.doi.org/10.1101/065128>

In preparation:

Evans SE, Todd-Brown, K Jacobson, P Jacobson. Non-rainfall moisture: an unaccounted for stimulator of litter decomposition. *Global Change Biology*

Evans SE, K Jacobson, P Jacobson, R Logan. A first assessment of microbial community composition, activity, and role in litter degradation in a hyperarid, fog-driven, desert. *Frontiers in Microbiology*

Widder, S, **SE Evans**, C Kaiser. The influence of microbial physiology and microscale spatial pattern formation on soil C and N turnover. *Ecology Letters*

Fitzpatrick, SW, **SE Evans**, K Sullam, E Zandona. The role of the gut microbiome in rapid evolution. *International Society of Microbial Ecology Journal (ISMEJ)*

Evans SE, K Dougherty, H Kittredge, W West. Dispersal rescues microbial function under abiotic stress. *Ecology Letters*.

West, W⁺⁺, Bloodworth⁺, K, **SE Evans**.

⁺⁺Postdoctoral researcher

⁺Undergraduate

RESEARCH GRANTS

Funded

2016 - 2018. NSF LTER. The KBS LTER: Long Term Ecological Research in Row Crop Agriculture Project. Role: coPI. PI: Steve Hamilton (\$2,254,000)

2016 - 2017. National Geographic Society Waitt Grant. Microbial transport in the Namib Desert: from ocean to desert, via fog. Role: **PI** (\$11,400)

2016 - 2017. MSU Strategic Partnership Travel Funding. African Studies Program. Microbial transport in the Namib Desert: from ocean to desert, via fog. Role: **PI**. (\$10,200)

August 1, 2015- July 31, 2020: Connecting nitrogen transformations mediated by the rhizosphere microbiome to perennial cropping system productivity in marginal lands. Office of Biological and Environmental Research, Department of Energy. Role: **PI**. coPIs: Lisa Tiemann, Maren Friesen, Jim Cole (\$5,771,832). * Press: MSU Today, Sept 9, 2015.

2012-2014: Amazon Web Services, Education grant for Amazon Cloud Computing. Role: **PI**. (\$10,000)

2012-2015: Next Generation of Microbial Ecological Indicators, Powell Center, USGS. Role: major contributor to grant-writing as a PhD student. PIs: Ed Hall, Matt Wallenstein, Jay Lennon

2011-2012: NSF Doctoral Dissertation Improvement Grant, 2011. Dissertation research: Does long-term drought alter the response of microbial communities to moisture? Role: graduate student coPI and primary writer. PI: Matt Wallenstein, graduate adviser (\$14,742)

Invited for full proposal (submitted 2016):

NSF DEB. Collaborative Proposal: Accounting for non-rainfall moisture in surface litter decomposition. Role: **PI**. coPIs: Kathy Jacobson, Peter Jacobson (\$477,909 total, \$269,101 to Evans at MSU)

FELLOWSHIPS

- NSF Postdoctoral Fellowship in Biology (Mathematics/Biology), 2012 (\$130,000, 2 years)
- NSF International Institute for Applied Systems Analysis (IIASA) Young Scientists Fellowship, Advisors: Christina Kaiser, Oskar Franklin, Ulf Dieckmann, 2012 (\$8,000).
- NSF Graduate Research Fellowship, 2009-2012 (\$137,000 over three years)

- NSF East Asia & Pacific Summer Institute (EAPSI) fellowship for summer research in China, 2008 (\$5,000)

AWARDS AND HONORS

- Grinnell College Alumni Scholar Award, 2013
- CSU Natural Resource Ecology Laboratory Outstanding Graduate Student Award, 2011
- Editor's Choice Award for 2011 publication in *Journal of Ecology* Issue 6, November, 2011
- NSF RCN FORECAST Training travel grant, 2012 (\$1,650)
- Best Student Presentation, Biogeosciences, Ecological Society of America Meeting, 2011
- Argonne Soils Metagenomics Workshop Travel Grant: 2010 and 2011 (\$1,000)
- Graduate Degree Program in Ecology Travel Grant: 2010, 2011 (\$1,000)
- American Geophysical Union (AGU) Travel Award to attend annual meeting, 2010 (\$500)
- Natural Resource Ecology Laboratory Francis Clark Soil Biology Scholarship, 2009 (\$4,000)
- Colorado State University, travel for International Conference on Soil Organic Carbon, 2009
- Recruitment award, Graduate Degree Program in Ecology (CSU), 2007 (\$2,000)
- Elsie Stoffer Award for biological study abroad in Costa Rica, 2004 (\$1,000)
- Grinnell College Environmental Studies Grant for participation in Juneau Icefield Research Program, 2003 (\$2,000)
- Grinnell College Merit-based scholarship, 2001, (\$20,000 over 4 years)

PRESENTATIONS

Invited Seminars

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| 2016 | The National Academies of Sciences, Engineering and Medicine study on "Microbiomes of the Built Environment: From Research to Application". Invited speaker for 3 rd committee meeting. Irvine, CA. |
| 2016 | EDAMAME speaker: Explorations in Data Analysis for Metagenomic Advances in Microbial Ecology, Hickory Corners, MI |
| 2016 | Western Michigan University, Department of Biological Sciences Seminar series, "Microbial responses to global change: moving from pattern to process" Kalamazoo, MI |
| 2016 | Cary Institute for Ecosystem Studies, Scientific Seminar Series, "Microbial and biogeochemical responses to shifts in precipitation patterns" Millbrook, NY |
| 2015 | Michigan State University, Ecology, Evolutionary Biology, and Behavior Seminar Series "Microbial responses to global change: moving from pattern to process" East Lansing, MI |
| 2015 | EDAMAME speaker: Explorations in Data Analysis for Metagenomic Advances in Microbial Ecology, Hickory Corners, MI |
| 2014 | University of Pretoria, Centre for Microbial Ecology and Genomics. "Microbial and biogeochemical responses to shifts in precipitation patterns" Pretoria, South Africa |

- 2013 Grinnell College Alumni Scholar seminar, "Do microbes adapt to climate change and does it matter for carbon cycling" Grinnell, IA
- 2012 University of Vienna, Division of Microbial Ecology, "Microbial and biogeochemical responses to precipitation patterns" Vienna, Austria

Selected presentations

***indicates invited**

+ indicates led by advisee

- +West, W (postdoctoral researcher), Bloodworth, K (undergraduate), **SE Evans**. 2016. Linking the carbon and nitrogen cycle in switchgrass marginal lands. World Congress for Undergraduate Research. Doha, Qatar
- +Chicoine, T (graduate student), S Roley, P Robertson, L Tiemann, M Friesen, **S Evans**. 2016. Variation in microbial communities and nitrogen transformation rates among switchgrass varieties. Phytobiome Symposium. Santa Fe, New Mexico.
- Evans, SE**. 2016. Does microbial dispersal via rain maintain soil diversity and function? International Society for Microbial Ecology Meeting. Montreal, Canada.
- ***Evans, SE**. 2016. Connecting nitrogen transformations mediated by the rhizosphere microbiome to perennial cropping system productivity in marginal lands. DOE Genomic Sciences Contractor-PI Meeting. Tysons, VA (*invited session: Systems Biology Research to Advance Sustainable Bioenergy Crop Development*).
- ***Evans, SE**. 2016. Connecting nitrogen transformations mediated by the rhizosphere microbiome to perennial cropping system productivity in marginal lands. DOE Genomic Sciences Contractor-PI Meeting. Tysons, VA (*invited session: Systems Biology Research to Advance Sustainable Bioenergy Crop Development*).
- ***Evans, SE**, Jacobson, PJ, Jacobson, KM, Seely, M. 2015. Rewetting without rain: cryptic controls on dryland decomposition revealed in a hyperarid desert. Ecological Society of America Annual Meeting. Baltimore, MD (*invited oral session, "Rewetting dry soil: the century's unifying problem in soil microbial ecology"*)
- +Chepng'eno, Hepsbia (undergraduate), K Dougherty, **SE Evans**. 2015. Microbes respond to predicted changes in rainfall. Kellogg Biological State Undergraduate Research Symposium. Kellogg Biological Station, Hickory Corners, MI.
- ***Evans, SE**. 2015. Stochasticity in microbial community dynamics. 2014. Ecological Society of America Annual Meeting. Baltimore, MD. (*IGNITE, invited oral session, "When tiny things rule the world"*)
- ***Evans, SE**, SD Allison, JBH Martiny. 2014. Quantifying stochastic and deterministic drivers of microbial community assembly: results from a traits-based model. Ecological Society of America Meeting, Sacramento, CA (*invited oral session, "Community ecology writ small"*)
- ***Evans, SE**, MD Wallenstein, August, 2013. Microbial community responses to changes in rainfall: moving from pattern to process. Ecological Society of America Meeting, Minneapolis, MN (*invited symposium presentation, "Defining which microbial processes matter to ecosystems and how to measure them"*)

- ***Evans, SE**, MD Wallenstein. 2012. Can we use microbial life strategies to understand the response of microbial communities to moisture stress? International Society for Microbial Ecology Annual Meeting. Copenhagen, Denmark (*oral presentation*)
- Evans, SE**, C Kaiser, O Franklin, U Dieckmann. 2012. What mechanisms explain soil carbon dioxide flux under fluctuating rainfall patterns? Young Scientists Summer Workshop, Int'l Institute for Applied Systems Analysis (IIASA). Laxenburg, Austria (*oral presentation*)
- ***Evans, SE**, MD Wallenstein. 2011. Does long-term drought alter the response of soil microbial communities to moisture? Argonne Soil Metagenomics Workshop. Bloomingdale, IL (*invited oral presentation*)
- Evans, SE**, MD Wallenstein. 2011. Does long-term drought alter the response of soil microbial communities to moisture? Ecological Society of America Annual Meeting. Austin, TX (*oral presentation*). **Received the Biogeosciences Section Best Student Presentation Award*
- Evans, SE**, IC Burke, WK Lauenroth, GS Zhou. 2009. The response of soil organic carbon to land use and precipitation in grasslands of Inner Mongolia, China. International Conference on Soil Organic Matter, Colorado Springs, CO (*presentation*)
- Evans, SE**. 2006. Ethics and Protocols of Social and Environmental Research in Southern Africa, Winter Term course, "Protocols in International Research" University of Virginia, Charlottesville, VA (*presentation*)
- Evans, SE**. 2004. Snow mass balance on the Juneau Icefield: climatic implications from long-term data. Juneau Icefield Research Program annual summer research symposium. Atlin, British Columbia, Canada (*presentation*)

TEACHING EXPERIENCE

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| 2016 | ZOL 357. Global Change Biology. Department Integrative Biology, Michigan State University |
| 2015 | PLB 809. Pathways to Success (Professional Development Seminar for postdocs & graduate students). Kellogg Biological Station, Michigan State University |
| 2015 | ZOL 890. Special Topic: Microbial Robustness (Graduate seminar). Kellogg Biological Station, Michigan State University |
| 2015 | Guest lecturer, MMG 425. Microbial Ecology. Michigan State University |
| 2012 | Guest lecturer, BY 320. Ecology. Colorado State University |
| 2012 | Teaching Asst., NR 120. Environmental Conservation. Colorado State University |
| 2005 – 2006 | Training and Outreach Coordinator, Grinnell Corps Fellow (1 year position), Gobabeb Training and Research Centre, Namib Desert, Namibia, Africa |

SERVICE

Reviewer

Scientific Journals: Science, Nature Climate Change, Ecology Letters, Global Change Biology, Soil Biology and Biochemistry, Soil Science Society of America Journal, Frontiers in Microbiology, New Phytologist, Geobiology

Ad hoc proposal reviewer: Baylor University (Young Investigator Development Program), The Office of the Vice Provost for Research

Panelist: NSF Doctoral Dissertation Improvement Grant (DDIG), DEB Ecosystems Panel, 2015

Ad hoc reviewer: Likens publication award, Biogeosciences Section, Ecological Society of America, 2014

Michigan State University

2014 – present Seminar Committee (chair), Kellogg Biological Station
2014 – present Graduate Affairs Committee, Kellogg Biological Station
2015 Brown Bag Seminar, “How to get a DDIG: field report from NSF panel”
2015 Faculty Advisory Committee, Kellogg Biological Station

Working group participation and organization

[‡] Indicates lead role or organizer

2016 DroughtNET (NSF RCN) Workshop, Sevilleta NWR, NM (invited participant)
2015 National Academies of Science Keck Futures Initiative (NAFKI) conference, workshop, and idea generation: Art and science frontier collaborations (invited participant)
2015 [‡]LTER All Scientists Meeting Workshop Organizer: LTER based perspectives on analyzing microbial community structure, function, and process
2015 Prioritizing directions for long-term ecological research in the U.S. (invited participant, NSF award to Lau and Bradford)
2014 – 2015 FOGLIFE colloquium and collaborative working group (invited participant)
2012 – 2015 [‡]Next Generation of Microbial Ecological Indicators, Powell Center, USGS (co-grant writer, grant awarded to Wallenstein, Lennon, Hall)
2008 – 2012 Front Range Student Ecology Symposium organizing committee, Colorado State University (Secretary, 2009).
2010 Graduate Student Representative, Natural Resource Ecology Lab, Colorado State University

MENTORING

Graduate student advisees:

Robert Logan (PhD student, NSF GRFP recipient)
Heather Kittredge (PhD student)
Tayler Chicoine (PhD student, NSF GRFP recipient)

Undergraduate researchers:

2016: Kelechi Ukuchukwu (Michigan State University), Kathryn Bloodworth (SEEDS REU Fellow), Ellen James (University of Michigan), Ben Dougherty (Michigan State University)
2015: Hepsiba Chepng'eno (Michigan State University), URA in summer 2015 at KBS.
2014: SEEDS Mentor (program to promote diversity in ecological sciences), ESA Annual Meeting
2010-2012: Mentored 3 female students on independent projects

Graduate student committees

Doctoral: Dustin Kincaid (Steve Hamilton, KBS), Jackson Sorensen (Ashley Shade, MMG), Di Liang (Phil Robertson, KBS), Danny O'Donnell (Elena Litchman, KBS), Darian Marinis (Lisa Tiemann, PSM)

Masters: Lindsay Williams (Matt Schrenk, IBIO/GEO)