

# Elizabeth M. Bach

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## EDUCATION

2010-2014	Iowa State University	Ph. D. <i>Ecology &amp; Evolutionary Biology</i>
2007-2009	Southern Illinois University, Carbondale	Master of Science <i>Plant Biology</i>
2003-2007	Cornell College <i>Magna cum laude</i> Phi Beta Kappa	Bachelor of Arts (honors) <i>Biology</i> <i>Environmental Studies</i>

## RESEARCH INTERESTS

My research focuses on soil fungal and bacterial communities and their role in carbon and nitrogen cycling. I apply next-generation sequencing and classic biogeochemistry laboratory methods to link microbial biodiversity with ecosystem functioning across spatial scales ranging from within soil aggregates to full ecosystems. My work has focused on grassland systems and restoration ecology.

## PROFESSIONAL EXPERIENCE

2016- current	Executive Director/Postdoctoral Researcher	Global Soil Biodiversity Initiative School of Global Environmental Sustainability & Biology Department Colorado State University
2014- 2016	Postdoctoral Research Associate	Illinois Natural History Survey
2010- 2014	Graduate Research Assistant  Graduate Teaching Assistant Plant Science Institute Research Fellow	Iowa State University
2010	Land Management Research and Demonstration Intern	Neal W. Smith National Wildlife Refuge

2007- NSF GK-12 Fellow Southern Illinois University  
2009 Graduate Research Assistant Carbondale  
Graduate Teaching Assistant

## GRANTS & FELLOWSHIPS

### *Research Grants*

- 2014- Plant and fungal community phenology in restored tallgrass prairie. Friends of  
2015 Nachusa Grasslands Science Research Grant. **Bach, E.M.**, Miller, A.N.
- 2014- Understanding microbial contributions to soil aggregation and organic matter  
2015 accumulation. Leopold Center for Sustainable Agriculture. Hofmockel, K.S.,  
**Bach, E.M.**
- 2013 Sequencing intra-aggregate fungal communities. Lois F. Tiffany Fellowship.  
**Bach, E.M.**
- 2012- Effects of diversity on the prairie experience. Iowa Native Plant Society.  
2013 Sullivan, L.S., Mortensen, B.D., **Bach, E.M.**
- 2012- The Everett Casey Nature Center and Reserve Reconstruction Project:  
2013 Research experimentation and educational outreach. Iowa Living Roadway  
Trust Fund. Sullivan, L.S., Mortensen, B.D., **Bach, E.M.**, Hofmockel, K.S.,  
Harpole, W.S.

### *Fellowships*

- 2014- Plant phenology drives soil fungal communities and carbon storage in prairies.  
2016 Illinois Natural History Survey. **Bach, E.M.**
- 2010- Iowa State University Plant Science Institute Fellow. **Bach, E.M.**  
2014
- 2008- NSF GK12 Graduate Fellow Southern Illinois University Carbondale. **Bach,**  
2009 **E.M.**
- 2007- R. J. McElroy Foundation Graduate Fellow. **Bach, E.M.**  
2010

## SELECT PUBLICATIONS

Riggs, C.E; Hobbie, S.E.; **Bach, E.M.**; Hofmockel, K.S.; Kazanski, C.E. 2015. Nitrogen addition changes grassland soil organic matter decomposition. *Biogeochemistry* 125:203-219, doi:10.1007/s10533-015-0123-2

**Bach, E. M.**; Hofmockel, K.S. 2015. A time for every season: Soil aggregate turnover stimulates decomposition and reduces carbon loss in grasslands managed for bioenergy. *Global Change Biology Bioenergy* doi:10.1111/gcbb.12267

**Bach, E. M.**; Hofmockel, K. S. 2015. Coupled Carbon and Nitrogen inputs increase microbial biomass and activity in prairie bioenergy systems. *Ecosystems* 18:417-427, doi:10.1007/s10021-014-9835-8

Baer, S.G.; **Bach, E.M.**; Meyer, C.K.; DuPreez, C.; and Six, J. 2015. Restoration of cultivated soil in the Free State (South Africa) and comparison to Nebraska (United States) provides a global perspective of belowground ecosystem recovery in response to grassland restoration. *Ecosystems* 18:390-403, doi: 10.1007/s10021-014-9833-x

Brown, K.; **Bach, E.**, Drijber, R.; Hofmockel, K.; Jeske, E.; Sawyer, J.; Castellano, M. 2014. A long-term nitrogen fertilizer gradient has little effect on soil organic matter in a high-intensity maize production system. *Global Change Biology* 4:1339-1350, doi: 10.1111/gcb.12519

**Bach, E.M.**, Hofmockel, K.S. 2014 Soil aggregate isolation method affects measures of intra-aggregate extracellular enzyme activity, *Soil Biology & Biochemistry* 69: 54-62, doi:10.1016/j.soilbio.2013.10.033

**Bach, E.M.**; Baer, S.G.; Six, J. 2012. Plant and soil responses to high and low diversity grassland restoration practices, *Environmental Management* 49: 412-424, doi:10.1007/s00267-011-9787-0

**Bach, E.M.**; Baer, S.G.; Meyer, C.K.; Six, J. 2010. Soil texture affects soil microbial and structural recovery during grassland restoration, *Soil Biology & Biochemistry* 42: 2182-2191, doi:10.1016/j.soilbio.2010.08.014

Baer, S. G.; Meyer, C.K.; **Bach, E.M.**; Klopf, R.P.; and Six, J. 2010. Contrasting ecosystem recovery on two soil textures: implications for carbon mitigation and grassland conservation. *Ecosphere* 1(1):art5, doi:10.1890/ES10-00004.1

**FACULTY OF 1000**

## **SELECTED PRESENTATIONS**

Hofmockel, K.S., Williams, R. J., **\*Bach, E. M.**, Howe, A. C. 2014. Microbial community composition and function in soil aggregates from a fertilized prairie. Annual Meeting of the Ecological Society of America, Aug. 10-15, 2014. Sacramento, CA.

**\*Bach, E. M.**, and Hofmockel, K. S. 2014. Soil structure affects seasonal microbial activity in restored grassland agroecosystems. *Soil's Role in Restoring Ecosystem Services*, March 6-9, 2014. Sacramento, CA

**\*Bach, E. M.**, and Hofmockel, K. S. 2013. Ecosystem functioning in restored tallgrass prairie affected by fertilizer addition. 5<sup>th</sup> World Conference on Ecological Restoration. Oct. 7-11, 2013. Madison, WI.

\***Bach, E. M.**, and Hofmockel, K. S. 2013. Biological, physical, and temporal constraints on extracellular enzyme activity in prairie and corn bioenergy systems. Annual Meeting of the Ecological Society of America. Aug. 4-11, 2013. Minneapolis, MN

## **TEACHING**

2015	Microbial Metagenomics (IB 546)	University of Illinois
2013	Plant Systematics (BIO 366)	Iowa State University
2011	General Mycology (MICRO 456)	Iowa State University
2008- 2009	Introductory and advanced high school chemistry (GK-12 Fellowship)	Herrin High School, Herrin, IL
2007- 2008	General Botany (PLB 200)	Southern Illinois University Carbondale

## **SELECT OUTREACH PRODUCTS**

2016 (forthcoming)	The Importance of carbon storage for plant and soil health. Leopold Center for Sustainable Agriculture
2016 (forthcoming)	Prairie underground. Prairie Smoke: Naschusa Grasslands Annual Stewardship Report for 2015
2016	A World beneath our feet. Illinois Natural History Survey Reports. <a href="http://wxw.inhs.illinois.edu/resources/inhsreports/">http://wxw.inhs.illinois.edu/resources/inhsreports/</a>
2015	Episode 35- Soils. In Defense of Plants Podcast <a href="http://www.indefenseofplants.com/podcast/2015/11/15/ep-35-soils">http://www.indefenseofplants.com/podcast/2015/11/15/ep-35-soils</a>
2013-present	@SoilOrgMatters Twitter <a href="https://twitter.com/SoilOrgMatters">https://twitter.com/SoilOrgMatters</a>