

# Christine D. Sprunger

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## Education

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- Ph.D. in Crop and Soil Sciences** Dec. 2015  
**and Ecology, Evolutionary Biology, and Behavior**  
*Michigan State University*
- B.S. in Forest Resources, with Honors** June 2010  
*University of Washington*
- B.A. Program on the Environment, Minor in Human Rights** June 2010  
*University of Washington*

## Appointments

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- Assistant Professor of Soil Science and Rhizosphere Processes** Aug. 2018-Present  
*School of Environment and Natural Resources, The Ohio State University*  
*InFACT Discovery Theme*
- Post-doctoral Research Scientist** Jan-July 2018  
*School of Environment and Natural Resources, The Ohio State University*
- NSF Post-doctoral Fellow in Biology** 2016-2018  
*Agriculture and Food Security Center, Columbia University*

## Publications

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**Sprunger, C.D.**, S.W. Culman, C.A. Palm, B. Vanlauwe. (Under review). Long-term application of high quality residues enhances maize yield and soil nutrient pools across Kenya. *Nutrient Cycling in Agroecosystems*.

Culman, S.W., S.S. Snapp, **C.D. Sprunger**, M.H. Ollenburger, B. Basso, L.R., DeHaan. (In revision). Perennial grain kernza wheatgrass impacts water quality more rapidly than soil quality. *Agriculture and Environmental Letters*.

Pugliese, J.Y., S.W. Culman, **C.D. Sprunger**. Accepted. Grain and forage harvest of a perennial grain crop, Kernza (*Thinopyrum intermedium*), increases its productivity and soil nutrient cycling. *Plant and Soil*.

**Sprunger, C.D.**, S.W. Culman, G.P. Robertson, and S.S. Snapp. 2018. How does nitrogen and perenniality influence belowground biomass and nitrogen use efficiency in small grain cereals? *Crop Science* 58, 2110-2120.

**Sprunger, C.D.**, S.W. Culman, G.P. Robertson, and S.S. Snapp. 2018. Perennial grain on a Midwest Alfisol shows no sign of early soil carbon gain. *Renew Agric Food Syst* 33, 360–372.

**Sprunger, C.D.** and G.P. Robertson. 2018. Early accumulation of active fraction soil carbon in newly established cellulosic biofuel systems. *Geoderma* 318, 42-51.

**Sprunger, C.D.**, L.G. Oates, R.J. Jackson and G.P. Robertson. 2017. Plant community composition influences fine root production and biomass allocation in perennial bioenergy cropping systems of the upper Midwest, USA. *Biomass and Bioenergy* 105, 248-258.

*In Preparation:*

**Sprunger, C.D.** B.E. O'Neill, K. Chung, J. Kerr, and G.P. Robertson. Do total soil carbon tests meet farmer management needs? Measures of active carbon versus static soil organic matter pools. *In preparation.*

**Sprunger, C.D.** S.W. Culman, Peralta, A.L. DuPont, S.T., Lennon, J.T., and Snapp, S.S. Changes in soil food webs, carbon, and nitrogen in a transitioning perennial grain system. *In preparation.*

**Sprunger, C.D.** S.W. Culman, D. Jackson-Smith. Crop diversity impacts on soil health: a regional analysis. *In preparation.*

## **Published Datasets**

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**Sprunger, C. D.** and G. P. Robertson. 2018. Data from: Early accumulation of active fraction soil carbon in newly established cellulosic biofuel systems. Dryad Digital Repository. <https://doi.org/10.5061/dryad.7jq46> doi: 10.5061/dryad.7jq46.

## **Competitive Grants**

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Lindsey, L. E. Hawkins, and **C.D. Sprunger**. Identifying the cause of soybean self-thinning using Climate FieldView™. Bayer Crop Science. \$68,512. *Pending.*

**Sprunger, C.D.** Uncovering the hidden half of cover crops: Linking belowground processes to nutrient availability and agronomic performance. North Central Region SARE. Preproposal. *Pending.*

**Sprunger, C.D.** Rainfall extremes and rhizosphere dynamics: Implications for soil health and crop productivity. OARDC Seeds. \$49,987. *Pending.*

Tomich et al., Tipping the scales towards a sustainable food system: connecting soil health practices from microbiomes to working landscapes. USDA AFRI SAS. \$10,000,000 *Pending*.

Baethgaen, W. and **Sprunger, C.D.** 2016. Developing and assessing soil carbon management and restoration recommendations for climate smart agriculture: A pilot study with smallholder farmers in Tanzania. Columbia University, The Earth Institute: Cross-Cutting Initiative. \$30,000.

**Sprunger, C.D.** and G.P. Robertson. 2015. Biodiversity effects on soil carbon gain in annual and perennial cropping systems. USDA Sustainable Agriculture Research and Education Program; 2014-2015. \$6,382.

## **Fellowships, Honors, and Awards**

National Science Foundation Post-Doctoral Fellowship in Biology, \$138,000	2016,2017
ASA, CSSA, SSSA Graduate Student Leadership Award	2014
Kellogg Biological Station Graduate Research Fellowship, \$1000	2014
ASA, CSSA, SSSA Future Leaders in Science Award, Washington D.C.	2014
National Ford Foundation Fellowship, \$66,000	2012-2014, 2016
Michigan State University Enrichment Fellowship, \$48,000	2010, 2015
Soil Science Society of America Meeting, Cincinnati, OH, Student Poster Award	2012
Michigan Organic Reporting Session, Graduate Student Poster Award	2013
National Science Foundation Graduate Research Fellowship (Honorable mention)	2012
Kellogg Biological Station, Summer Student Fellowship, \$1000	2011
Michigan Organic Reporting Session, Graduate Student Poster Award	2011
Undergraduate Travel Award, Forest Resources, University of Washington, \$400	2009

## **Professional Experience**

**Hazardous Waste Inspector and Compliance Officer** 2008-2010  
Supervisor: Jeff KenKnight  
U.S. Environmental Protection Agency, Region 10; Seattle, WA  
Led hazardous waste inspections and extracted samples for evidence. Prepared penalty calculations for enforcement cases. Wrote inspection reports and enforcement

documents. Other responsibilities included producing a strategy report focused on inspection targeting. Served as the Alaska State Coordinator from June 2009-Sept. 2010.

## **Presentations**

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Hoekstra, N.C. **C.D. Sprunger**, N.T. Basta, M.M Gardiner, and S.W. Culman. 2019. The impact of Vegetation Management Strategies on Soil Health in Urban Vacant Lots. Soil Science Society of America International Annual Meeting. San Diego, CA.

Wade, J., S.W. Culman, T.T. Hurisso, and **C.D. Sprunger**. 2019. Benefits and Limitations of Soil Carbon, Nitrogen and Biological Measures of Soil Health. Soil Science Society of America International Annual Meeting. San Diego, CA.

**Sprunger, C.D.**, S.W. Culman, C.A. Palm, B. Vanlauwe. (2017). Integrated soil fertility management has altering effects on soil health and crop productivity across sites in Kenya. Soil Science Society of America Meeting. Tampa, Florida. Oral Presentation.

**Sprunger, C.D.**, and G.P. Robertson. (2015). Differences in active, slow, and resistant soil carbon fractions under annual and perennial biofuel crops. Long Term Ecological Science All Scientists Meeting. Estes Park, Colorado. Poster Presentation.

**Sprunger, C.D.**, G.P. Robertson, R.D. Jackson, and L.G. Oates. (2015). Differences in fine root production and C allocation among perennial cropping systems in contrasting soils of the upper Midwest. Ecological Society of America Annual Meetings. Baltimore, Maryland. Oral Presentation.

**Sprunger, C.D.**, and G.P. Robertson (2014). Differences in active and slow soil carbon fractions under annual and perennial biofuel crops. Soil Science Society of America Meeting. Long Beach, CA. Poster Presentation.

**Sprunger, C.D.**, S.S. Snapp, and S.W. Culman (2013). Root production an indicator for belowground nitrogen use efficiency in perennial and annual grain cropping systems. Soil Science Society of America Meeting. Tampa, FL. Oral Presentation.

**Sprunger, C.D.**, S.S. Snapp, and S.W. Culman (2013). Implications for carbon sequestration: Management effects on annual and perennial root production. Michigan Organic Reporting Session, East Lansing, MI. Poster Presentation.

**Sprunger, C.D.**, S.S. Snapp, and S.W. Culman (2013). Implications for carbon sequestration: Management effects on annual and perennial root production. LTER Kellogg Biological Station All Scientist Meeting, East Lansing, MI. Poster Presentation.

**Sprunger, C.D.**, S.S. Snapp, and S.W. Culman (2012). Implications for carbon sequestration: Management effects on annual and perennial root production. Soil Science Society of America Meeting, Cincinnati, OH. Poster Presentation.

**Sprunger, C.D.**, S.S. Snapp, and S.W. Culman (2012). Annual vs. perennial roots: Implications for carbon sequestration in agriculture. Ford Foundation Fellowship Conference, Newport Beach, CA. Poster Presentation.

**Sprunger, C.D.**, S.S. Snapp, and S.W. Culman (2012). Conventional and Organic Management Effects on Annual and Perennial Root Biomass. Michigan Organic Reporting Session, East Lansing, MI. Poster Presentation.

**Sprunger, C.D.** and D. Zabowski (2011). Organic farming and its effect on soil carbon content. Michigan Organic Reporting Session, East Lansing, MI. Poster Presentation.

**Sprunger, C.D.** and D. Zabowski (2009). Organic farming and its effect on soil carbon content. Program on the Environment Symposium, University of Washington, Seattle. Oral Presentation.

**Sprunger, C.D.** and D. Zabowski (2009). Organic farming and its effect on soil carbon content. Soil Science Society of America Meeting, Pittsburgh. Poster Presentation.

## **Invited Seminars, Extension Workshops, and Media**

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**Sprunger, C.D.** 2019. Sustainable Agriculture: Can we increase crop productivity while reducing agriculture's environmental footprint? Department of Biology Seminar Series, College of Wooster. Wooster, OH. Invited Seminar Speaker.

**Sprunger, C.D.** and S. W. Culman. 2019. On-farm evaluation of crop diversity effects on soil health and ecosystem function in the Great Lakes Region. Special Session. Soil Science Society of America International Annual Meetings. San Diego, CA. Invited Oral Presentation.

**Sprunger, C.D.** 2018. Root production and soil carbon dynamics in agroecosystems. Microbial Based Solutions for Agriculture. The Ohio State University. Wooster, OH. Invited Oral Presentation.

**Sprunger, C.D.** 2018. Root production and soil carbon dynamics in agroecosystems: A biogeochemical and social science approach. School of the Environment and Natural Resources, The Ohio State University. Invited Oral Presentation.

**Sprunger, C.D.** 2017. Managing soil carbon: Implications for enhanced crop productivity, long-term soil health, and climate change mitigation. Department of Biology Seminar Series, East Carolina University. Invited Seminar Speaker.

**Sprunger, C.D.** 2017. Diversity and Inclusion in STEM. Department of Biology, East Carolina University. Greenville, North Carolina. Invited Oral Presentation.

**Sprunger, C.D.** 2017. Soildoc Maproom Climate Tool Application. USAID funded workshop. Morogoro, Tanzania. Extension Talk: Invited Oral.

**Sprunger, C.D.** 2016. The importance of Active Soil C. Prairie Public: Main Street Radio. Radio Show Interview. Friday, July 22, 2016.  
<http://www.prairiepublic.org/radio/mainstreet>

O'Neill, B.E. and **C.D. Sprunger**. 2015. Results of soil health tests on Michigan farms. Farming for the Future Conference. Paw Paw, MI. Extension Talk: Oral.

**Sprunger, C.D.**, S.S. Snapp, and S.W. Culman (2013). Management impacts on belowground carbon dynamics: annual versus perennial cropping systems. Special Session on Managing Belowground Processes in Agroecosystems. Ecological Society of America Annual Meeting, Minneapolis, MN. Oral Presentation.

**Sprunger, C.D.** and B. Gottshall (2012). Perennialization in Urban and Rural Landscapes to Enhance Ecosystem Services. LTER All Scientist Meeting. Estes Park, CO. Oral Presentation/Workshop Moderator.

## **Teaching and Mentoring**

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*Invited Guest Lecture* November 2018

- Crop rotations, diversity, and perenniality impacts on nutrient cycling
- SENR Soil Fertility Course. Wooster, OH.

*Invited Guest Lecture* November 2018

- Sustainable management practices for enhanced yields and ecosystem services
- ATI Soil fertility Course. Wooster, OH.

*Invited Guest Lecture* November 2017

- Sustainable management practices for enhanced yields and ecosystem services
- SENR Soil Fertility Course. Columbus, OH.

*Invited Guest Lecture* July 2017

- Using sustainable agriculture to enhance crop productivity and ecosystem services in the United States and abroad.
- Columbia University Lamont Summer Intern Lecture Series. Palisades, NY.

*Invited Guest Lecture* July 2017

- Introduction to soil science and sustainable agriculture
- Florida International University Upward Bound Program. Miami, FL.

*Invited Guest Lecture* July 2016

- Sustainable Agriculture: Can we increase crop productivity while reducing agriculture's environmental footprint?
- Columbia University Lamont Summer Intern Lecture Series. Palisades, NY.

*Mentor to Alessandra Zuniga* Summer 2014

- Research Experience for Undergraduates Program at the Kellogg Biological Station.
- Completed M.S. in Biology from Northern Arizona University (2017)

*Mentor* to Lazarius Miller Summer 2014

- Undergraduate Research Apprentice Program at the Kellogg Biological Station

*Mentor and Supervisor* to Marie-Flore Doyen Summer 2013

- Undergraduate Exchange Program between the Kellogg Biological Station and Purpan University
- Completed Masters of Agriculture from Purpan University (2016)

*Mentor and Tutor* to twenty Sexton high school students 2011-2012

- College Ambition Program at Sexton High School, Lansing MI.

## **Service**

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### **The Ohio State University**

- SENR Hydrology Position Search Committee
- Fall 2018-Spring 2019

### **The Ohio State University**

- SENR Soil Science Curriculum Re-vamp
- Weekly meetings, Fall 2018

### **The Ohio State University**

- InFact Discovery Theme Strategic Planning Retreat, Initiative for Food and AgriCultural Transformations, September 6, 2018

**Peer Reviewer:** PNAS, Biogeochemistry, Agriculture, Ecosystems, and the Environment, Plant and Soil, Soil Science Society of America, Geoderma, and Agronomy Journal

**Mentor,** The Fairy Godsisiter mentoring program, February 2017-April 2018  
New York City

**Tour Guide,** Long Term Ecological Research Site June 2014-2015  
Kellogg Biological Station, Michigan State University

**Communicating Science Volunteer,** Science Festival April 2014  
Michigan State University

**Graduate Student Representative,** Seminar Committee 2014-2015  
Kellogg Biological Station, Michigan State University

**Graduate Student Representative,** Academic Programs Committee, 2013-2014

Kellogg Biological Station, Michigan State University

**Communicating Science Volunteer**, Share the harvest, Kellogg Biological Station, Michigan State University Oct. 2013

**Graduate Student Representative**, Graduate Program Committee, Department of Plant, Soil, and Microbial Sciences, Michigan State University 2011-2013

**Secretary**, Crop and Soil Science Graduate Student Organization. Department of Plant, Soil, and Microbial Sciences, Michigan State University 2010-2013

**Co-Chair**, Professional Development Committee, Graduate Women in Science Association, Michigan State University Chapter 2011-2012

### **Professional Development Training**

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Teaching Assistant Seminar and Orientation, Michigan State University 2013

Science policy, Communication, and Advocacy training, ASA, CSSA,SSSA 2014

Mentoring workshop, W.K. Kellogg Biological Station 2013

Stable Isotope Biogeochemistry intensive course, Michigan State University 2012

Cropping System Modeling Course (SALUS), Michigan State University 2011

40-hour Hazardous Waste Training, Environmental Protection Agency 2009

Resources Conservation and Recovery Act three-day training, McCoy Associates 2008

### **Professional Memberships**

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Ecological Society of America, Soil Science Society of America, Association for Women Soil Scientists, Graduate Women in Science, Xi Sigma Pi Honor Society.

### **Outreach and Public Engagement**

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Soil health testing for organic corn growers across Michigan, Indiana, Ohio, and Pennsylvania. Fall 2018 and Spring 2019.

Generating Soil Health Test Results for 200+ farmers across the Great Lakes Region. Fall and Spring 2018 and Spring 2019.