

# SHELBY C. MCCLELLAND, Ph.D.

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<b>EDUCATION</b>	<b>Colorado State University</b> <span style="float: right;"><b>2021</b></span> <b>Fort Collins, CO</b> Doctor of Philosophy   Ecology <i>Dissertation:</i> The Ecology of Natural Climate Solutions – Quantifying Soil Carbon and Biodiversity Benefits <i>Advisor:</i> Meagan Schipanski, Ph.D.
	<b>Colorado State University</b> <span style="float: right;"><b>2019</b></span> <b>Fort Collins, CO</b> Graduate Certificate   Data Analysis
	<b>Cornell University, College of Agriculture and Life Sciences</b> <span style="float: right;"><b>2014</b></span> <b>Ithaca, NY</b> Bachelor of Science   International Agriculture and Rural Development, <i>Cum Laude</i> <i>Advisor:</i> Johannes Lehmann, Ph.D.

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<b>SCIENTIFIC EXPERTISE &amp; INTERESTS</b>	Agroecology, animal agriculture, biodiversity, biogeochemistry, carbon dioxide removal, climate policy, COMET-Farm, database management, data science, DayCent, ecosystem ecology, ecosystem modeling, enteric methane, environmental conservation, grassland management, greenhouse gas emissions, livestock sustainability, nature based solutions, negative emission technologies, plant sampling, soil biology, soil carbon sequestration, soil health, wildlife conservation.
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<b>RESEARCH EXPERIENCE</b>	<b>Postdoctoral Associate   Cornell University</b> <span style="float: right;"><b>March 2022-Present</b></span> Soil and Crop Sciences, School of Integrative Plant Science, Ithaca, NY <i>Supervisor:</i> Dominic Woolf, Ph.D. <i>Co-supervisor:</i> Johannes Lehmann, Ph.D.
	<b>Livestock Production &amp; Climate Change Specialist   FAO</b> <span style="float: right;"><b>April 2021-March 2022</b></span> Livestock Information, Sector Analysis and Policy Branch, Remote <i>Supervisor:</i> Timothy Robinson, Ph.D.
	<b>Climate Change &amp; Soil Health Scientist   AFT</b> <span style="float: right;"><b>November 2020-April 2021</b></span> American Farmland Trust, Climate Initiative, Remote <i>Supervisor:</i> Jennifer Moore, Ph.D.
	<b>Graduate Research Assistant   Colorado State University</b> <span style="float: right;"><b>June 2017-May 2021</b></span> Dept. of Crop and Soil Sciences, Fort Collins, CO <i>Supervisor:</i> Meagan Schipanski, Ph.D.
	<b>Research Analyst   Environmental Defense Fund</b> <span style="float: right;"><b>June 2015-May 2017</b></span> Office of the Chief Scientist, San Francisco, CA <i>Supervisor:</i> Lisa Moore, Ph.D.
	<b>Staff Research Associate   UC ANR</b> <span style="float: right;"><b>March 2015-June 2015</b></span> UC Sierra Foothill Research and Extension Center, Browns Valley, CA <i>Supervisor:</i> Jeremy J. James, Ph.D.

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<b>TEACHING EXPERIENCE</b>	<b>Teaching Assistant   Department of Soil and Crop Sciences</b> <span style="float: right;"><b>2017 – 2020</b></span> General Crops, Colorado State University; <i>Supervisor:</i> Meagan Schipanski, Ph.D.
	<b>Undergraduate Teaching Assistant   Department of Crop and Soil Sciences</b> <span style="float: right;"><b>2014</b></span>

Introduction to Field Crops, Cornell University; *Supervisor*: Timothy Setter, Ph.D.

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<b>HONORS &amp; AWARDS</b>	Gary “Pete” Peterson Dryland Scholarship	2019
	Colorado State University Graduate Student Council Travel Award	2019
	Graduate Degree Program in Ecology Travel Award	2019
	American Society of Agronomy, Cover Crop Division, Oral Presentation, 3 <sup>rd</sup> place	2019
	Front Range Student Ecology Symposium Oral Presentation, 2 <sup>nd</sup> place	2019
	Annie’s Sustainable Agriculture Scholarship	2018
	Aurora Organic Dairy Academic Scholarship	2018
	Front Range Student Ecology Symposium Poster Contest, 1 <sup>st</sup> place	2018
	NSF Graduate Research Fellowship, Honorable Mention	2016
	Meinig Family Cornell National Scholar	2011 – 2014

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**PROFESSIONAL  
AFFILIATIONS** American Geophysical Union  
American Society of Agronomy  
Soil Science Society of America

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**PROFESSIONAL  
SERVICE** **Conferences and workshops**  
*Jumpstarting the New Carbon Economy*, Columbia University, January 27-28, 2020  
  
*Coming to the Table! Building an equitable and inclusive college together*, Colorado State University, January 23, 2020  
  
*Summer Soil Institute*, Colorado State University, June 11-22, 2018  
  
**Manuscript reviews**  
*Agronomy, Ecological Applications, Forestry Research, Rangelands, Science of the Total Environment, SOIL*  
  
**Proposal & grant reviews**  
Alfred P. Sloan Foundation, USDA National Institute of Food and Agriculture  
  
**Professional service, leadership, mentorship, and volunteer activities**  
Session Co-Organizer, *Soil Science in the Age of Climate Action: Is a Solution Truly Under Our Feet?* American Geophysical Union, December 13-17, 2021  
  
FAO LEAP *Methane Technical Advisory Group*, Contributing Author (2021)  
  
Selection Committee Member, Gary “Pete” Peterson Dryland Scholarship, *Soil Science Society of America*, 2021  
  
Sustainability Leadership Fellow, *School of Global Environmental Sustainability* (2020-2021)  
  
*Soil Carbon Working Group*, New Carbon Economy Consortium, Member (2020)  
  
*Graduate Degree Program in Ecology*, New Student Mentor (2020-2021)  
  
Biological Solutions Track Co-organizer, *New Carbon Economy Consortium Conference* Columbia University, January 27-28, 2020  
  
*Graduate Degree Program in Ecology Executive Committee*, Student Representative (2019-2020)

Hiring Committee Member, *Graduate Degree Program in Ecology Director* (2020)

*United Nations Framework Convention on Climate Change, Conference of the Parties, Colorado State University Delegate* (2018-2019)

*Front Range Student Ecology Symposium, Vice-President & Organization Committee Chair* (2019), Volunteer (2018-2020)

*Research and Extension Experience for Undergraduates (REEU), Colorado State University, Mentor* (2018-2019)

*Graduate Women in Science, Science Communication Outreach Volunteer* (2017-2018)

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**PEER-REVIEWED  
PUBLICATIONS**

9. **McClelland, S.C.**, Cotrufo, M.F., Haddix, M.L., Paustian, K., and Schipanski, M.E. (*accepted*). Infrequent organic amendment applications increased plant productivity and Soil organic carbon in irrigated but not dryland perennial pastures. *Agriculture, Ecosystems, and Environment*.

8. Arndt, C., Hristov, A. N., Price, W. J., **McClelland, S. C.**, Pelaez, A. M., Cueva, S. F., Oh, J., Bannink, A., Bayat, A. R., Crompton, L. A., Dijkstra, J., Eugène, M. A., Kebreab, E., Kreuzer, M., McGee, M., Martin, C., Newbold, C. J., Reynolds, C. K., Schwarm, A., Shingfield, K. J., Veneman, J. B., Yáñez-Ruiz, D. R., Yu ZhongTang (*accepted*). Full Adoption of The Most Effective Strategies to Mitigate Methane Emissions by Ruminants Can Help Meet the 1.5°C Target by 2030 but Not 2050. *Proceedings of the National Academy of Sciences*.

7. **McClelland, S.C.**, Paustian, K., Williams, S., and Schipanski, M.E. (2021). Modeling cover crop biomass production and related emissions to improve farm-scale decision-support tools. *Agricultural Systems*, 191, p.103151.

6. Jabbour, R., **McClelland, S.C.**, and Schipanski, M.E. (2021). Use of decision - support tools by students to link crop management practices with greenhouse gas emissions: A case study. *Natural Sciences Education*, p.e20063

5. **McClelland, S.C.**, Paustian, K., Schipanski, M.E. (2020). Management of cover crops in temperate climate influences soil organic carbon stocks – A meta-analysis. *Ecological Applications*. <http://doi.org/10.1002/eap.2278>

4. Garbowski, M., Avera, B., Bertram, J., Courkamp, J., Gray, J., Hein, K., Lawrence, R., McIntosh, M., **McClelland, S.C.**, Post, A., Slette, I., Winkler, D., Brown, C. (2020). Getting to the root of restoration: Considering root traits for improved restoration outcomes under drought and competition. *Restoration Ecology*.

3. Niu, M., Kebreab, E., Hristov, A. N., Oh, J., Arndt, C., Bannink, A.,..., **McClelland, S.C.**,... & Crompton, L. A. (2018). Prediction of enteric methane production, yield and intensity in dairy cattle using an intercontinental database. *Global Change Biology*. <https://doi.org/10.1111/gcb.14094>

2. **McClelland, S.C.**, Arndt, C., Gordon, D.R., Thoma, G. (2018). Type and number of environmental impact categories used in livestock life cycle assessment: A systematic review. *Livestock Science*. ISSN 1871-1413

1. Wezel, A., Soboksa, G., **McClelland, S.**, Delespesse, F. Boissau, A. (2015). The blurred boundaries of ecological, sustainable, and agroecological intensification. A review. *Agronomy for Sustainable Development*. DOI 10.1007/s13593-015-0333-y

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**OTHER PUBLICATIONS**  
Non-referred articles and communication

1. **McClelland, S.C.** (30 March 2021). "Moving beyond climate 'silver bullets' in agriculture." Human Nature Blog. School of Global and Environmental Sustainability. <https://sustainability.colostate.edu/humannature/shelby-mcclelland/>

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**OTHER PUBLICATIONS**  
Manuscripts in review

5. Todd-Brown, K.E.O, Abramoff, R.Z., Beem-Miller, J., Blair, H.K., Earl, S., Frederick, K.J., Fuka, D.R., Guevara Santamaria, M., Harden, J.W., Heckman, K., Haren, L.J., Holmquist, J.R., Hoyt, A.M., Klinges, D.H., LeBauer, D.S., Malhotra, A., **McClelland, S.C.**, Nave, L.E., Rocci, K.S., Schaeffer, S.M., Stoner, S., van Gestel, N., von Fromm, S.F., Younger, M.L. (*under revision*). Review and Synthesis: The promise of big soil data, moving current practices towards future potential. *Biogeosciences*.

4. Foster, E.J., Gosnell, H., Hunt, S., Hodbod, J., Levy, C.R., Machmuller, M.B., **McClelland, S.C.**, Saifuddin, M., Stanley, P., Swan, A., Zelikova, T.J., and Filley, T. (*in review*). Soil carbon primer for U.S. agricultural policy. *WIREs Climate Change*.

3. Hughes, H.M., **McClelland, S.C.**, Paustian, K., Schipanski, M.E., and Hillier, J. (*in review*). Modelling the soil carbon impacts of cover crops in temperate regions. *Soil and Tillage Research*.

2. **McClelland, S.C.**, Haddix, J.D., Azad, S., Boughton, E., Boughton, R., Miller, R.S., Swain, H., and Dillon, J.A. (*under revision*). Quantifying biodiversity impacts in livestock life cycle assessments. *Frontiers in Ecology and the Environment*.

1. Moore, J.M., Manter, D.K., Bowman, M., Hunter, M., Bruner, E., and **McClelland, S.C.** (*under revision*). Applying Decision Support Tools to Estimate Current and Future Climate Mitigation Potential for US Agriculture. *Journal of Soil and Water Conservation*.

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**INVITED TALKS & PRESENTATIONS**

**McClelland, S.C.** "When is cover cropping an effective practice to increase soil carbon?" *International Soil Carbon Network, American Geophysical Union, and United States Department of Agriculture Climate Hubs Webinar Series*. Online. September 29, 2021.

**McClelland, S.C.** "Compost improves soil health and food productivity." State of the Science: Looking forward to 2030 and beyond. *School of Global Environmental Sustainability*. Colorado State University. Fort Collins, CO. February 19, 2020

**McClelland, S.C.** "Statement to the Koronivia Joint Work on Agriculture Workshop 'Improved nutrient use and manure management towards sustainable and resilient agricultural systems' on behalf of the Research and Independent NGOs." 25<sup>th</sup> Conference of the Parties. *United Nations Framework Convention on Climate Change*. Madrid, Spain. December 2-13, 2019.

**McClelland, S.C.** "You, Me, and the UNFCCC – An ecologist's experience at COP 24." ECOL 592. *Graduate Degree Program in Ecology*. Colorado State University. Fort, Collins, CO. October 02, 2019.

**McClelland, S.C.** "You, Me, and the UNFCCC – An ecologist's experience at COP 24." Departmental Seminar Series. *Department of Soil and Crop Sciences*. Colorado State University. Fort, Collins, CO. April 04, 2019.

**McClelland, S.C.**, Wroten, K., Trejo, M., de Jong, N., McCormick, G., Tomlin, H. "Food for Our Future." 24th Conference of the Parties. *United Nations Framework Convention on Climate Change*. Katowice, Poland. December 2-14, 2018.

**McClelland, S.C.** and Leach, A. “The Environmental Impacts of Food Production.” *Eat for Your Life*. Fort Collins, CO. September 15, 2018.

**McClelland, S.C.** “EDF & Agriculture: How we work.” *Cornell Dairy Science Club*. San Francisco, CA. January 21, 2017.

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**CONFERENCE  
ABSTRACTS &  
PRESENTATIONS**  
Oral

**McClelland, S.C.**, Cotrufo, M.F., Haddix, M. L., Paustian, K., and Schipanski, M.E. “Rethinking soil carbon sequestration – accounting for soil inorganic carbon stocks.” Soil Science Society of America. Salt Lake City, UT. November 7-10, 2021.

Arndt, C., Hristov, A.N., Price, W.J., **McClelland, S.C.**, Pelaez, A.M., Welchez, S.F.C., Oh, J., Bannik, A., Bayat, A.R., Crompton, L.A., Dijkstra, J., Eugène, M.A., Krebeab, E., Kreuzer, M., McGee, M., Martin, C., Newbold, C.J., Reynolds, C. K., Schwarm, A., Shingfield, K.J., Veneman, J.B., Yáñez-Ruiz, D.R., Yu, Z. “Successful strategies to reduce enteric methane emission from ruminants: A meta-analysis.” *American Dairy Science Association*. June 22-24, 2020.

**McClelland, S.C.**, Paustian, K., Schipanski, M.E. “Management of cover crops influences soil organic carbon stocks – A meta-analysis.” *American Society of Agronomy*. San Antonio, TX. November 10-13, 2019.

Poster

**McClelland, S.C.**, Haddix, J.D., Azad, S., Boughton, E., Boughton, R., Lollis, G., Sclater, V., Swain, H., and Dillon, J.A. “Quantifying Biodiversity Co-benefits from Livestock Production – A Case Study of Beef Grazing Management in Central Florida.” *American Geophysical Union*. New Orleans, LA. December 13-17, 2021.

**McClelland, S.C.**, Schipanski, M.E. “Above and belowground community responses to infrequent compost applications in semi-native and improved pastures.” *Ecological Society of America*. Online. August 03-06, 2020.

**McClelland, S.C.**, Conant, R., Haddix, M., Schipanski, M.E. “Ecosystem productivity and carbon storage under infrequent organic matter amendments.” *Front Range Student Ecology Symposium*. Fort Collins, CO. February 27-28, 2019.

**McClelland, S.C.**, Conant, R., Haddix, M., Schipanski, M.E. “Soil health impacts of infrequent compost application in an irrigated perennial pasture system.” *Soil Science Society of America*. San Diego, CA. January 6-9, 2019.

Jackman, J., **McClelland, S.C.**, Schipanski, M.E. “Impact of compost soil amendment on nitrogen availability in grazed perennial grassland.” *Soil Science Society of America*. San Diego, CA. January 6-9, 2019.

**McClelland, S.C.**, Paustian, K., Sanderson, J., Schipanski, M.E. “Nitrogen and herbivore-induced effects on soil carbon sequestration in the Colorado shortgrass steppe.” *Front Range Student Ecology Symposium*. Fort Collins, CO. February 13-15, 2018.

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**SKILLS**

**Language:** French – B2, working professional fluency.

**Software:** Adobe Dreamweaver, Microsoft Word, Excel, and PowerPoint, Latex, EndNote, Google Suite, R, Simile, and WordPress; basic HTML, CSS, and Python.

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**REFERENCES**

Available upon request.