

EMILY BURCHFIELD

Assistant Professor ◊ Department of Environmental Sciences
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RESEARCH AND TEACHING INTERESTS

Food system sustainability, geospatial programming and analysis

APPOINTMENTS

- Emory University** *August 2019 - present*
Assistant Professor
Department of Environmental Sciences, Emory College of Arts and Sciences
- Utah State University** *May 2019 - present*
Adjunct Professor
Department of Environment and Society, Quinney College of Natural Resources
- Utah State University** *August 2017 - July 2019*
Assistant Professor of Geospatial Analysis
Department of Environment and Society, Quinney College of Natural Resources

EDUCATION

- Vanderbilt University** *May 2017*
Ph.D. in Environmental Engineering
- University of Louvain, Belgium** *July 2012*
M.A. in Economics, Grande Distinction
- Clemson University** *May 2010*
B.A. in Economics, Magna Cum Laude, Calhoun Honors College, Phi Beta Kappa
- University of Louvain, Belgium** (dual-degree with Clemson) *May 2010*
B.S. in Economics and Management, Transatlantic Exchange in Economics Scholar

PUBLICATIONS

*Graduate advisee co-author, ⁺Graduate non-advisee co-author

Nelson, K., **Burchfield, E.** (2021). Landscape complexity and US crop production. *Nature Food*.
<https://doi.org/10.1038/s43016-021-00281-1>

Burchfield, E., Nelson, K. (2021). Agricultural yield geographies in the United States. *Environmental Research Letters*. 16, 054051. <https://doi.org/10.1088/1748-9326/abe88d>

Burchfield, E., Schumacher, B.* (2020). Bright spots in US corn production. *Environmental Research Letters*. 15, 10. <https://doi.org/10.1088/1748-9326/aba5b4>

Spangler, K.*, **Burchfield, E.**, Schumacher, B.* (2020) Past and current dynamics of US agricultural land use and policy. *Frontiers in Sustainable Food Systems*, 4, 9.
<https://doi.org/10.3389/fsufs.2020.00098>

Burchfield, E., Matthews-Pennanen, N.⁺, Stoebner, J., Lant, C. (2019). Changing yields in the Central United States under climate and technological change. *Climatic Change*, 159, 329-346.
<https://doi.org/10.1007/s10584-019-02567-7>

Burchfield, E., Nelson, K., Spangler, K.* (2019). The impact of agricultural diversification on U.S. crop production. *Agriculture, Ecosystems & Environment*. 285, 106615. <https://doi.org/10.1016/j.agee.2019.106615>

Tozier-de-la-Poterie, A., **Burchfield, E.**, Carrico, A. (2018). The implications of group norms for adaptation in collectively-managed agricultural systems: evidence from Sri Lankan Paddy farmers. *Ecology and Society*. 23(3):21. <https://doi.org/10.5751/ES-10175-230321>

Burchfield, E., Williams, N., Carrico, A. (2018). Rescaling drought mitigation in rural Sri Lanka. *Regional Environmental Change*. 18(8): 1-14. <https://doi.org/10.1007/s10113-018-1374-y>

Burchfield, E., Tozier-de-la-Poterie, A. (2018). Determinants of crop diversification in rice-dominated Sri Lankan agricultural systems. *Journal of Rural Studies*. 61, 206-215. <https://doi.org/10.1016/j.jrurstud.2018.05.010>

Nay, J., **Burchfield, E.**, Gilligan, J. (2018). A machine-learning approach to forecasting remotely sensed vegetation health, *International Journal of Remote Sensing*. 39(6), 1800-1816. <https://doi.org/10.1080/01431161.2017.1410296>

Nelson, K., **Burchfield, E.** (2017). Effects of the structure of water rights on agricultural production during drought: A spatiotemporal analysis of California's Central Valley. *Water Resources Research*. 53(10), 8923 - 8309. <https://doi.org/10.1002/2017WR020666>

Burchfield, E., Gilligan, J. (2016). Agricultural adaptation to drought in the Sri Lankan dry zone. *Applied Geography*. 77, 92-100. <https://doi.org/10.1016/j.apgeog.2016.10.003>

Burchfield, E., Nay, J., Gilligan, J. (2016). Application of machine learning to prediction of vegetation health. *International Archives of the Photogrammetry, Remote Sensing and Spatial Information Sciences*. XLI-B2, 465-469, [doi:10.5194/isprs-archives-XLI-B2-465-2016](https://doi.org/10.5194/isprs-archives-XLI-B2-465-2016)

Burchfield, E., Gilligan, J. (2016). Dynamics of individual and collective agricultural adaptation to water scarcity. *Winter Simulation Conference 2016 Proceedings*. Available at SSRN: <https://ssrn.com/abstract=2807452>

Gunda, T., Benneyworth, L., **Burchfield, E.** (2015). Exploring water indices and associated parameters: A case study approach, *Water Policy*, 17(1), 98 - 111. <https://doi.org/10.2166/wp.2014.022>

Nwosu, O., Hennessey, E., **Burchfield, E.**, Barnes, S., Brinkley-Rubenstein, L., and Shields, S. (2013). Faculty and Student Experiences as a Model for the Academy in Action. In Barnes, S. L., Brinkley-Rubenstein, L., Doykos, B., and Martin, N. (Eds). *Academics in Action! A Model for Community-Engaged Research, Teaching, and Service*.

ARTICLES IN REVIEW

Burchfield, E., Schumacher, B., Spangler, K., Rissing, A. (2021). The state of US farm operator livelihoods. *Under review at Frontiers in Sustainable Food Systems*.

Schumacher, B.* , Yost, M., **Burchfield, E.**, Allen, N. (2021). Water in the West: trends, production efficiency, and a call for open data. *Revised and resubmitted to Journal of Environmental Management*.

Nottebrock, H., **Burchfield, E.**, Fenster, C. (2021). Farmers' delivery of floral resources: to 'bee' or not to 'bee.' *Revised and resubmitted at American Journal of Botany*.

Christman, M.⁺, Spears, L., Strange, J., Pearse, W., **Burchfield, E.**, Ramirez, R. (2021). Land-use and climate drive shifts in *Bombus* assemblage composition. *Revised and resubmitted at Landscape Ecology*

Burchfield, E. (2021). The future of US croplandscapes. *Under review at Global Environmental Change.*

Spangler, K., Schumacher, B., Bean, B., **Burchfield, E.** (2021). Path dependencies in US agriculture: Regional factors of diversification *Under review at Agriculture, Ecosystems and Environment.*

Schumacher, B.* , **Burchfield, E.**, Yost, M. (2021). Utility of machine learning for yield predictions. *Submitted at Agricultural Systems.*

GRANTS

Agricultural landscape management for improved sustainability (Co-PI, \$499,949) 2020-2023
USDA NIFA BNRE Program

Socioenvironmental indicators of Great Salt Lake desiccation (Co-PI, \$34,988) 2020-2021
Utah State University SPARC Program

Resilience of agricultural systems to climate stress (PI, \$42,498) 2018-2020
Utah Agricultural Experiment Station

Finding Balance: Diversity and Agricultural Production (PI, \$19,938) 2018-2019
Utah State University Research Catalyst Grant

Local Water Conservation Research and Education Needs (Co-PI, \$19,401) 2018-2019
Utah State University Extension Grants Program

Data-driven drought effect estimation (PI, \$25,000 for travel and stipends) 2016-2017
[National Socio-environmental Synthesis Center \(SESYNC\)](#) Graduate Pursuit

American Institute for Sri Lankan Studies Dissertation Planning Grant (PI, \$4,500) 2015

TEACHING

Emory, ENVS 224: Economy and the Environment 2021 - present

Emory, ENVS 270: Environmental Data Science 2020 - present

USU, GEOG 3800: Data Visualization 2018

USU, ENVS 2000: Natural Resources Professional Orientation 2018

USU, GEOG 49/6950: Geospatial Analysis 2018 - 2019

Vanderbilt Programs for Talented Youth 2015 - 2016
Developed and taught geospatial analysis to gifted middle and high school students.

Certificate in College Teaching 2014
Vanderbilt University Center for Teaching

GRADUATE ADVISING

Jared Gingrich (MS, Environmental Sciences, Emory, *In progress*)

UNDERGRADUATE ADVISING

Emily Isaac (BS - Honors, Environmental Sciences, Emory, *In progress*)

Ilana Fischer (BS - [SIRE Program](#), Environmental Sciences, Emory, *In progress*)

Kendra Ding (BS - Environmental Sciences, Emory, *In progress*)

STUDENT COMMITTEES

Morgan Christman (Ph.D. Biology, USU, *In progress*)

PAST ADVISEES

Primary Advisor

Kaitlyn Spangler (PhD, Environment and Society, USU, 2021)

Britta Schumacher (MS Ecology, USU, 2020)

Committee Member

Jenna Keaton (MS Watershed Sciences, USU, 2019)

Neil Matthews-Pennanen (MS Environment and Society, USU, 2017)

PAPER PRESENTATIONS

Geographies of US food production, presented at the Association for the Study of Food and Society Annual Conference, held virtually, June 2021.

Geographies of agricultural production, presented at the Applied Statistics in Agriculture and Natural Resources Annual Conference, held virtually, May 2021.

The future of U.S. croplands, presented at the American Association of Geographies Annual Meeting, held virtually, April 2021.

Invited: *Socio-environmental implications of changing U.S. landscapes*, presented to the PBEE Program Faculty at Emory University, November 2020.

Invited: *Agricultural sustainability in the U.S.*, presented to the Emeritus College at Clemson University, October 2020. [Video here.](#)

Invited: *Cultivating food security in a changing world*, presented to the PhenoRob Female Talk Series group at Universitat Bonn, July 2020. [Video here.](#)

The impact of agricultural diversification on U.S. crop production, presented at the International Association of Landscape Ecology Annual Meeting in Fort Collins, CO, April 2019.

Spatiotemporal dynamics of yield-response to climate extremes, presented at the American Association of Geographers Annual Meeting in New Orleans, LA, April 2018.

Agricultural response to changes in water availability and temperature in the coterminous U.S., presented at the American Geophysical Union Annual Meeting in New Orleans, LA, December 2017.

Application of machine learning to the prediction of vegetation health, presented at the International Society for Photogrammetry and Remote Sensing in Prague, Czech Republic, July 2016.

Agricultural adaptation in the Sri Lankan Dry Zone, presented at the IPWSD Workshop at Columbia University, NY, April 2016.

Application of machine learning to big environmental datasets to predict vegetation health, presented at the Association for American Geographers Annual Meeting in San Francisco, CA, April 2016. Session organizer, "Human-Environment Interactions: Linking Remote Sensing and the Social Sciences"

The application of PCA for the identification of adaptive agricultural systems in the tropics, presented at the Workshop on the Use of Remote Sensing for Decision-Making in Agricultural and Water Management in Colombo, Sri Lanka, August 2015.

Institutions and imagery: Mapping water management in rural Sri Lanka, presented at the Association of American Geographers Conference in Chicago, IL, April 2015.

ADAPT-SL: Agricultural Decision Making and Adaptation to Precipitation Trends in Sri Lanka, presented at the National Science Foundation Water, Sustainability and Climate PI meeting in Washington, D.C., February 2015.

Patterns of meteorological and agricultural drought in Sri Lankan agricultural areas, presented at the Gordon Research Seminar on Science, Technology and Policy, in Waterville Valley, NH, August 2014.

Resettlement and coloniality in the Mahaweli Ganga Watershed, presented at the Annual Dimensions of Political Ecology Conference on Nature/Society in Lexington, KY, February 2013.

POSTER PRESENTATIONS

Landscape complexity and US crop production, presented virtually at the Landscape 2021 conference in Berlin, Germany, September 2021.

Using R-INLA to understand institutional moderators of drought, presented at the useR! Conference in Brussels, Belgium, July 2017.

Dynamics of collective and individual agricultural adaptation to water scarcity, presented at the American Geophysical Union Conference in San Francisco, CA, December 2016.

Agricultural adaptation to water scarcity in the Sri Lankan dry zone: A comparison of two water management regimes, presented at the National Science Foundation Water, Sustainability and Climate PI meeting in Washington, D.C., February 2015.

Mapping water management: A case study from Sri Lanka, presented at the American Geophysical Union Annual Conference in San Francisco, CA, December 2014.

Patterns of meteorological and agricultural drought in the Sri Lankan Dry Zone, presented at the Gordon Research Conference on Science, Technology and Policy in Waterville Valley, NH, August 2014.

Patterns of agricultural drought in Sri Lankan paddy fields: Spatiotemporal image analysis, presented at the Borlaug Summer Institute on Global Food Security, Lafayette, IN, June 2014.

HONORS AND AWARDS

University Graduate Fellowship, Vanderbilt University 2012 - 2016

Martin Luther King Award for Service Excellence, Clemson University 2009

Duckenfield Scholarship, University of Oxford 2008

PROFESSIONAL MEMBERSHIPS

American Association of Geographers
American Geophysical Union

LANGUAGE PROFICIENCIES

English Native speaker
French Fluent written and spoken