SHELIE A. MILLER
University of Michigan, School for Environment and Sustainability
3532 Dana Building, 440 Church Street, Ann Arbor, MI 48109-1041
Phone: (734) 763-8645 • E-mail: sheliem@umich.edu

APPOINTMENTS

2018-	Director, Program in the Environment, University of Michigan
2016-	Jonathan W. Bulkley Collegiate Professor in Sustainable Systems
2013-	Associate Professor, University of Michigan**,** Ann Arbor MI School for Environment and Sustainability & Department of Civil and Environmental Engineering
2016-17	Jefferson Science Fellow, Washington DC National Academies of Sciences, Engineering, and Medicine USAID Global Development Lab, Center for Development Innovation
2010-13	Assistant Professor, University of Michigan**,** Ann Arbor MI School of Natural Resources and Environment & Department of Civil and Environmental Engineering
2006-10	Assistant Professor, Clemson University, Clemson SC Environmental Engineering and Earth Sciences
2001-06	Doctoral Resident, Alcoa Inc., Pittsburgh PA Environmental Health and Safety Division

EDUCATION

2006	PhD. Civil and Materials Engineering, University of Illinois at Chicago
2001	M.E. Civil and Environmental Engineering, Clarkson University
2000	B.S. Chemistry, Denison University

HONORS AND AWARDS

2017	University of Michigan Distinguished Faculty Fellow in Sustainability
2016	Jefferson Science Fellow, National Academies of Sciences
2013	Kavli Frontiers Fellow, National Academy of Sciences
2009	Presidential Early Career Award for Scientists and Engineers (PECASE), White House Office of Science and Technology Policy
2001-05	National Science Foundation IGERT Fellow

JOURNAL PUBLICATIONS (*denotes advisee)

Heard BR*, Taiebat M, Xu M, Miller SA. Sustainability implications of connected and autonomous vehicles for the food supply chain, *Resources, Conservation & Recycling*, 2018, 128: 22-24

Chen L*, Miller SA, Ellis BR. Comparative human toxicity impact of electricity produced from shale gas and coal, *Environmental Science & Technology*, 2017, 51(21): 13018-13027

Keerthi S*, Miller SA. Regional differences in impacts to water quality from the Bioenergy Mandate, *Biomass and Bioenergy*, 2017, 106:115-126.

Heard BR*, Miller SA, Liang S, Xu M. Emerging challenges and opportunities for the food-energy-water nexus in urban systems, *Current Opinion in Chemical Engineering*, 2017, 17:48-53.

Luo Y*, Miller SA. Using game theory to resolve the 'Chicken and Egg' situation in promoting cellulosic bioenergy development, *Ecological Economics*, 2017, 135:29-41

Alfaro JF*, Miller SA, Johnson JX, Riolo R. Improving rural electricity system planning: An agent-based model for stakeholder engagement and decision making, *Energy Policy*, 2017, 101: 317-331

Heard BR*, Miller SA. Critical research needed to examine the environmental impacts of expanded refrigeration on the food system, *Environmental Science & Technology*, 2016, 50(22): 12060-12071

Miller SA, Heard BR*. The environmental impact of autonomous vehicles depends on adoption patterns, *Environmental Science & Technology*, 2016, 50(12): 6119-6121

Sharp BE*, Miller SA. Potential for integrating diffusion of innovation principles into life cycle assessment of emerging technologies, *Environmental Science & Technology*, 2016, 50(6): 2271-2781

Kemausuor F*, Bolwig S, Miller S, Modelling the socio-economic impacts of modern bioenergy in rural communities in Ghana, *Sustainable Energy Technologies and Assessments*, 2016, 14: 9-20.

Bichraoui-Draper N, Xu M, Miller SA, Guillaume B. Agent-based life cycle assessment for switchgrass-based bioenergy systems, *Resources, Conservation & Recycling*, 2015, 103: 171-178.

Brunner A, Currie WS, Miller SA. Cellulosic ethanol production: landscape scale net carbon strongly affected by forest decision making, *Biomass and Bioenergy*, 2015, 83: 32-41.

Miller SA, Keoleian GA. Framework for analyzing transformative technologies in life cycle assessment, *Environmental Science & Technology*, 2015, 49(5): 3067-3075.

Orfield N, Levine R, Keoleian G. Miller S, Savage P. Growing algae for biodiesel on direct sunlight or sugars: A comparative life cycle assessment, *ACS Sustainable Chemistry and Engineering*, 2015, 3(3): 386-395.

Sarkar S*, Miller SA. Water quality impacts of converting intensively managed agricultural land to switchgrass, *Biomass and Bioenergy*, 2014, 68: 32-43.

De Kleine RD, Keoleian GA, Miller SA, Burnham A, Sullivan JL. Impact of updated material production data in the GREET life cycle model, *Journal of Industrial Ecology*, 2014, 18(3): 356-365.

Choudhary S, Liang S, Cai H, Keoleian GA, Miller SA, Kelly J, Xu M. Reference and functional unit can change bioenergy pathway choices, *International Journal of Life Cycle Assessment*, 2014, 19: 796-805.

Alfaro JF*, Miller SA. Extending industrial symbiosis to small holder farms: Modeling a case study in Liberia, West Africa, *Journal of Industrial Ecology*, 2014, 18(1): 145-154.

Alfaro JF*, Miller SA. Satisfying the rural residential demand in Liberia with decentralized renewable energy schemes, *Renewable and Sustainable Energy Reviews*, 2014, 30: 903-911.

Sharp B*, Miller SA. Estimating maximum land use change potential from a regional biofuel industry, *Energy Policy*, 2014, 65: 261-269.

Luo Y*, Miller SA. A game theory analysis of market incentives for US switchgrass ethanol, *Ecological Economics*, 2013, 93: 42-56.

Miller SA, Moysey S, Sharp B*, Alfaro JF*. A stochastic approach to model dynamic systems in LCA, *Journal of Industrial Ecology*, 2013, 17(3): 352-362.

Chamberlain JF*, Miller SA. Policy incentives for switchgrass production using valuation of non-market ecosystem services, *Energy Policy*, 2012, 48: 526-536.

Sarkar S*, Miller SA, Frederick JR, Chamberlain JF. Modeling nitrogen loss from switchgrass agricultural systems, *Biomass and Bioenergy*, 2011, 35(10): 4381-4389.

Chamberlain JF*, Miller SA. Using DAYCENT to quantify impacts of land use conversion to nitrogen-managed switchgrass in the southern U.S., *Agriculture, Ecosystems and Environment*, 2011, 141(3-4): 332-341.

Sarkar S*, Chamberlain JF*, Miller SA. A comparison of two methods to conduct material flow analysis on waste tires in a Small Island Developing State, *Journal of Industrial Ecology*, 2011, 15(2): 300-314.

Miller SA. Minimizing land use and nitrogen intensity of bioenergy, *Environmental Science & Technology*, 2010, 44(10): 3932-3939.

Miller SA, Landis AE, Theis TL. Environmental tradeoffs of bio-based production *Environmental Science & Technology*, 2007, 41(15): 5176-5182.

Miller SA, Landis AE, Theis TL, Reich RA. A comparative life cycle assessment of soybean oil and petroleum lubricants *Environmental Science & Technology*, 2007, 41(11): 4143- 4149.

Landis AE, Miller SA, Theis TL. Life cycle of the corn-soybean agroecosystem for bio-based production, *Environmental Science & Technology* 2007, 41(4): 1457-1464.

Miller SA, Landis AE, Theis TL. Using Monte Carlo simulation to characterize nitrogen flows in agroecosystems, *Environmental Science & Technology* 2006, 40(7): 2324-2332.

Miller SA, Theis TL. Comparison of life-cycle inventory databases: A case study using soybean production. *Journal of Industrial Ecology* 2006, 10(1-2):133-147.

Ramos BL, Miller SA, Korfmacher K. Implementation of a Geographic Information System in the chemistry curriculum: An exercise in integrating environmental analysis and assessment. *J. Chem. Education*. 2003, 80: 50-54.

PEER-REVIEWED BOOK CHAPTERS

Miller SA. "Avoiding the unintended consequences of bioenergy", Perspectives on Biofuels: Potential Benefits and Possible Pitfalls. Eds. C. Taylor, R. Lomneth, F. Wood-Black. ACS Books. 2012. Chapter 5, 87-100.

Korfmacher K, Ramos B, Miller SA. "Chemistry and environmental science: Investigating soil erosion and deposition in the lab and field", Understanding Place: GIS and Mapping Across the Curriculum. Ed. Sinton, D.S. and J. Lund. ESRI Press: Redlands, CA, 2007. 201-210.

PEER-REVIEWED CONFERENCE PROCEEDINGS

Heariret A, Choudhary S, Miller SA, Xu M. Using an agent-based approach to model the emerging bio-energy industry, *Proceedings of the 2012 IEEE International Symposium on Sustainable Systems and Technology*, Boston, MA, May 2012

Alfaro JF*, Miller SA. Planning the development of electricity grids in developing countries: An initial approach using agent based models, *Proceedings of the 2011 IEEE International Symposium on Sustainable Systems and Technology*, Chicago, IL May 2011

Alfaro JF*, Sharp BE*, Miller SA. Developing LCA techniques for emerging systems: Game theory, agent modeling as prediction tools, *Proceedings of the 2010 IEEE*

International Symposium on Sustainable Systems and Technology, Washington DC, 17-19 May 2010.

Seager TP, Miller SA, Kohn JL*. Land use and geospatial aspects of renewable energy. *Proceedings of the 2009 IEEE International Symposium on Sustainable Systems and Technology*, Phoenix AZ, 18-22 May 2009.

REPORTS AND OTHER PUBLICATIONS

Barteau M, Hoffman A, Maynard A, Miller S, Scavia D. Academic Engagement in Public and Political Discourse Preliminary Analysis of Survey Results. 2014
Available: http://graham.umich.edu/media/files/PrelimSurveyResults-PublicEngagement.pdf

Fang A*, Niese N*, Sharpe L*, Treanton M*. Analysis of the maximization of LEED points for the construction of a mid-rise apartment complex, *Agora: The Urban Planning and Design Journal of the University of Michigan*, University of Michigan, 2011, 5: 54-60.

Keoleian GA, Miller SA, De Kleine R.; Fang A, Mosley J. Life Cycle Material Data Update for GREET Model. Center for Sustainable Systems. University of Michigan. September 2011. pp 1-70.

Vander Mey BJ, Pascal S, Miller SA, Dodd VN, Bornholdt H. Place-Based International Service-Learning: Landscapes for Learning in the Commonwealth of Dominica, West Indies. 2008. In *Service-Learning at Clemson University: Increasing our Focus on Collaboration*, Ed. Woodard, K. pp. 18-25, Clemson Univ. Service Alliance.

INVITED LECTURES

2017 USAID, Global Development Lab, Applied Innovation and Acceleration, Washington DC

2017 National Academies of Sciences, Engineering, and Medicine, Jefferson Science Fellows Distinguished Lecture Series, Washington DC

2017 Environmental Defense Fund, Board of Directors Science Day Symposium, San Francisco CA

2016 Yale University, School of Forestry & Environmental Studies, New Haven CT

2016 UC-Irvine, Department of Civil and Environmental Engineering, Irvine CA

2016 Wayne State University, Sustainability @ Wayne Seminar Series, Detroit MI

2015 Argonne National Laboratory, Systems Science Center, Lemont IL

2015 University of New Hampshire, UNH Sustainability Lecture Series, Department of Environmental Engineering, Durham NH

2014 Tsinghua University, School of the Environment, Beijing China

2013 University of California Berkeley, Energy Biosciences Institute, Berkeley CA

2012 University of Illinois at Urbana-Champaign, Center for Advanced Bioenergy Research (CABER), Champaign, IL

2011 Denison University, Department of Chemistry and Biochemistry Alumni Seminar, Re-Dedication of Ebaugh Laboratories, Ronneberg Lecture Series, Granville, OH

2011 University of Illinois at Chicago, Institute of Environmental Science and Policy, Chicago IL

2009 Rochester Institute of Technology, Galisano Institute for Sustainability Seminar Series, Rochester, NY

2007 University of Michigan. Sustainable Engineering Systems lecture series, Ann Arbor, MI

2005 Purdue University, Civil Engineering seminar series

INVITED WORKSHOPS AND SYMPOSIA

2017 National Academies Keck Futures Initiative, "Beyond Boundaries: 15 Years of Exploring Intersections in Science, Engineering and Medicine", National Academy of Sciences, Irvine CA

2017 LCA of Emerging Technologies Workshop, Canada First Research Excellence Fund Initiative, Banff Alberta

2016 Critical Barriers to Progress in Sustainability Science
Gordon & Betty Moore Foundation, Irvine CA

2014 National Academies Keck Futures Initiative, "Collective Behavior: From Cells to Societies", National Academy of Sciences, Irvine CA

2014 Incorporating Bioenergy in Sustainable Landscape Designs. US DOE Bioenergy Technologies Office, Lemont IL

2013 Kavli Frontiers of Science Symposium, National Academy of Sciences, Irvine CA

2009 Workshop on Biofuel Technologies and their Implications for Water and Land Use, National Science Foundation, Atibaia, Brazil

2008 EPA Science Advisory Board, Integrated Nitrogen Meeting, Washington DC

2007 Nitrogen Workshop to Prioritize Environmental Policy, Environmental Defense, Washington DC

RECENT CONFERENCE PRESENTATIONS

2016 The Effect of Adoption Patterns on the Environmental Impacts of New Technology, *Gordon Research Conference on Industrial Ecology*, Stowe, VT, June 2016 (invited)

2015 Using Scenario Models to Estimate the Environmental Impacts of New Technologies, *Association of Environmental Engineering and Science Professors Meeting*, New Haven CT, June 2015

2015 Estimating the Environmental Impacts of Emerging Technologies, *International Symposium of Sustainable Systems and Technology*, Dearborn MI, May 2015

2015 A Proactive Approach to Manage Unintended Consequences of Emerging Technologies, *Engineering Sustainability Conference 2015*, Pittsburgh PA, April 2015 (invited)

2013 Using Diffusion of Innovations Principles in Future Scenario Modeling, *American Center for Life Cycle Assessment LCA XIII Conference*, Orlando FL, October 2013

2013 Modeling the Environmental Impacts of Emerging Energy Technologies, *Association of Environmental Engineering and Science Professors Meeting*, Golden CO, July 2013.

2011 Determining the Effect of Land Use Change on the Environmental Impacts of Bioenergy, *Association of Environmental Engineering and Science Professors Meeting*, Tampa, FL, July 2011

2011 Assessing the Non-Carbon Impacts of an Emerging Bioenergy Industry, *International Society of Industrial Ecology Conference*, Berkeley, CA, June 2011

2010 Avoiding the Unintended Consequences of Bioenergy, "Perspectives of Biofuels: Potential Benefits and Possible Pitfalls Symposium", *ACS Conference*, San Francisco, CA, March 23, 2010

2009 Land Use and Geospatial Aspects of LCA for Renewable Energy, *LCA IX Conference*; Boston, MA: September 30, 2009

2009 Minimizing Nitrogen and Land Use of Biofuels, *AEESP Conference*, Iowa City, IA, July 28, 2009

2009 Life Cycle Impacts of Bioenergy, *International Society of Industrial Ecology Meeting*, Lisbon Portugal, June 21-25, 2009

2008 Not All Biofuels Are Created Equal: A Comparison of Bioenergy Feedstocks, *SETAC*, November 17-20, 2008.

2007 Environmental Tradeoffs of Bio-based Production. *AEESP Conference*, Blacksburg, VA, 2007.

2007 Characterizing Carbon and Nitrogen Flows of Bio-based Products. *International Society of Industrial Ecology*, Toronto, Canada, 2007.

2005 Comparative Life Cycle Assessment of Biolubricants and Mineral Oils. *9th Annual Green Chemistry and Engineering Conference*, Washington D.C., 2005.

2005 Environmental Trade-Offs of Bio-based and Petroleum Lubricants. *Society of Tribologists and Lubrication Engineers*, Las Vegas, NV, 2005.

EXTERNAL FUNDING

2016-20 NSF UNS: U.S.-China: Integrated Systems Modeling of Food-Energy-Water (FEW) Nexus for Urban Sustainability, $499,990, PI: Ming Xu

2009-14 NSF CAREER award, Environmental Sustainability program, Creation of Predictive and Dynamic Life Cycle Assessment Tool; $403,000, PI: Shelie Miller

2011-14 NSF Environmental Sustainability, Developing a Spatially-Explicit Agent-Based Life Cycle Analysis Framework for Improving the Environmental Sustainability of Bioenergy Systems, $310,000, PI: Ming Xu

2010-14 NSF Science Master's Program: Sustainable and Resilient Infrastructure, $700,000, PI: Ronald Andrus, Clemson University

2011 Argonne National Laboratory, Update Material Production Modules in GREET 2 Model, $100,000, PI: Greg Keoleian, University of Michigan

2008-10 SC Energy Office, Examining the Potential Productivity and Site-Specific Management Needs of Switchgrass on the Coastal Plain; $143,523, PI: Jim Frederick, Clemson University

2008-09 SC Dept of Agriculture, Developing a Multidisciplinary Research and Outreach Program Focused on Switchgrass Production, $10,000, PI: Shelie Miller

2009 NSF Environmental Sustainability Program, Workshop Proposal: Land Use and Geospatial Aspects of Life Cycle Assessment; $80,000 PI: Tom Seager, RIT

2007-08 EPA People, Prosperity, and Planet Program: Waste Tires on the Island of Dominica: Survey and Solutions; $10,000, PI: Shelie Miller

UNIVERSITY SUPPORT

2016-17	MCubed Diamond: Defining Innovative Sustainable Solutions for Film-based Packages, Procter & Gamble, PI: Ming Xu
2014-17	Third Century Initiative Phase 2, REFRESCH: Researching Fresh Solutions to the Energy/Water/Food Challenge in Resource-Constrained Environments, PI: Johannes Schwank, $2,998,832
2016	UM Water Center, "Comparing Toxic Emissions of Shale Gas and Coal for Electricity Generation", PI: Shelie Miller $20,000
2013-14	M-Cubed, Hydraulic Fracturing of Shales: Water Contamination Risks, Treatment Options, and Fate of Fracking Fluids, PI: Brian Ellis $60,000
2013-14	Third Century Initiative, "REFRESCH: Researching Fresh Solutions to the Energy/Water/Food Challenge in Resource-Constrained Environments", PI: Johannes Schwank, $299,989
2012-14	UM/SJTU Collaboration on Renewable Energy Science and Technology, Integrated Energy-Economy Environment (3E) Modeling for Clean Vehicle Development in China, PI: Ming Xu, $200,000
2012-13	Elizabeth Caroline Crosby Faculty award, ADVANCE/Rackham Graduate School, Modeling Sustainable Electricity Development, PI: Shelie Miller $9500
2011-12	SNRE Seed Grant, Forming Collaborative Relationships with the University of Liberia, PI: Shelie Miller $7000
2011-12	STEM-Africa, University of Michigan African Studies Center, Industrial Ecology in Rural Settings, PI: Shelie Miller $8000
2008-10	Clemson University, Next Generation Graduate Fellowships grant (2 fellowships), PI: Shelie Miller $90,000
2008-09	Archibald Tropical Research and Education Center Foundation, Clemson University, Landscapes for Learning Dominica, PI: Brenda Vander May $7500
2007-08	University Research Grant, Clemson University, Characterization of Carbon and Nitrogen Fluxes from Switchgrass Grown for Energy, PI: Shelie Miller $3132

ADVISING

Committee Chair

Current	Brent Heard	PhD candidate
	Nicole Ryan	PhD candidate (co-chair)
	Evan Leon	MS student
2016	Shamitha Keerthi	PhD Natural Resources and Environment
2014	Jose Alfaro	PhD Natural Resources and Environment
2013	Ben Sharp	PhD Env. Engineering and Earth Sciences
2011	Jim Chamberlain	PhD Env. Engineering and Earth Sciences
2016	Lu Chen	M.S. Natural Resources and Environment
2015	Kiran Chawla	M.S. Natural Resources and Environment
2010	Joel Kuhn	M.S. Env. Engineering and Earth Sciences
2010	Watcharapol Pumkaew	M.S. Env. Engineering and Earth Sciences
2009	Saumya Sarkar	M.S. Env. Engineering and Earth Sciences

Committee Member

Current	Kevin Bi	PhD candidate
2018	Maryam Arbabzadeh	PhD Natural Resources and Environment
2014	Qiang Dai	PhD Civil and Environmental Engineering
2013	Nolan Orfield	PhD Natural Resources and Environment
2011	Marguerite Renouf	PhD Environmental Engineering
2014	Josh Novacheck	M.S. Natural Resources and Environment
2013	Joe Colett	M.S. Natural Resources and Environment
2012	Anna Clemons	M.S. Natural Resources and Environment
2011	Russell Martin	M.S. Env. Engineering and Earth Sciences
2010	Jenilee Harrison	M.S. Civil Engineering
2010	Andrea Hicks	M.S. Env. Engineering and Earth Sciences
2010	Dan Matz	M.S. Env. Engineering and Earth Sciences
2010	Dylan Fowler	M.S. Env. Engineering and Earth Sciences
2009	Michael Hickey	M.S. Env. Engineering and Earth Sciences
2008	David Simpson	M.L.A. Landscape Architecture

MASTERS' PROJECTS

2018-	Amcor, Towards a Global Plastics Protocol: Policy Solutions for Closing the Loop on Plastics
2016-17	Bell's Brewery, Decision Support for Water Supply Chain Management co-advised w/Joe Arvai
2015-16	Estimating GHG Emissions on Cattle Ranches in the Brazilian Amazon co-advised w/Arun Agrawal

2014-15 Kellogg Corporation, "Sustainable Agriculture in Asia"
co-advised w/ Ming Xu

Little Traverse Bay Bands of Odawa Indians; "Energy Audit"
co-advised w/ Greg Keoleian

More Than Me – Girls School in Liberia
co-advised w/ Jose Alfaro and Bob Grese

2011-12 Swedish Biogas, LLC ; "Life Cycle Modeling and Environmental Impact Assessment of Commercial Scale Biogas Production"

TEACHING

University of Michigan
ENV 433 Fossil and Renewable Energy Resources
ENV 201 Ecological Issues
NRE 597 Environmental Systems Analysis
NRE 557 Industrial Ecology

Clemson University
EES 486/686 Pollution Prevention and Industrial Ecology
EES 820 Environmental Systems Analysis
EES 806 Environmental Design
ENSP 200 Introduction to Environmental Science
EES 485/685 Hazardous Waste Management

PROFESSIONAL ACTIVITIES

Appointed or elected positions
Biomass Research and Development Technical Advisory Committee (2015-)
(Federal Advisory Committee, appointed by the US Secretaries of Energy and Agriculture)
Executive Committee, School of Natural Resources and Environment, U. Mich (2014-16)
Nominating Committee, International Society of Industrial Ecology (2011-14)
(Chair in 2014)
South Carolina Climate Energy and Commerce Advisory Committee;
Residential, Commercial, and Industrial Technical Workgroup (2008-09)

Other relevant service
Co-chair, Program in the Environment faculty transition committee (2017-18)
Program Management Review of the Bioenergy Technologies Office
US Department of Energy
Steering Committee (2015, 2017)
Lead Reviewer, Sustainability and Analysis technical area (2013)

External Advisory Board, Institute of Environmental Science and Policy, University of Illinois at Chicago (2013-)
Steering Committee, Academic Engagement in Public and Political Discourse, University of Michigan, 2013-15
National Agricultural Library Open LCI Committee, USDA (2011)
Technical Advisory Committee, Carbonfund.org (2008-10)
South Carolina Biomass Council (2006-10)
Review Panels: NSF, USDA, DOE, EPA, SunGrant, G8 Research Councils, Ellen MacArthur Foundation New Plastics Economy Initiative

WORKSHOP AND CONFERENCE ORGANIZATION

2016 ISSST Conference Technical Committee, Tempe AZ
2015 ISSST Conference Technical Committee, Dearborn MI
2011 ISSST Conference Technical Committee, Chicago IL
2011 AEESP Conference Technical Committee, Tampa FL
2010 ISSST Session Chair, Washington DC
2009 Workshop Co-Chair, Workshop on Land Use in LCA, Boston MA
2009 AEESP Session Co-Chair, Iowa City, IA
2009 ISIE Technical Committee, Lisbon Portugal
2008 Gordon Conference on Industrial Ecology, Organizing Committee
2007 Student Conference on Industrial Ecology, Faculty Advisor, Angola IL

MEMBERSHIPS

International Society of Industrial Ecology, ISIE (2001-)
Society of Environmental Toxicology and Chemistry, SETAC (2006-)
Assoc. of Environmental Engineering and Science Professors, AEESP (2007-)
American Association for the Advancement of Science, AAAS (2015-)

Last Updated: February 2018