

Abigail R. Clarke-Sather (née Clarke), Ph.D.

Assistant Professor, University of Delaware, abigail@udel.edu, abigailclarke-sather.com
801 Chrysler Ave, Newark, Delaware, 19711 302-354-2325

Education

- 2009 Ph.D. Mechanical Engineering, Michigan Technological University
Advisors: John W. Sutherland, Purdue Univ., Qiong Zhang, Univ. of S. Florida
- 2007 Graduate Sustainability Certificate, Michigan Technological University
- 2006 M.S. Mechanical Engineering, Michigan Technological University
- 2004 B.A. Physics with College Honors, Earlham College

Computing: SimaPro, MATLAB, ArcGIS, Homer, Mathematica, LabVIEW

Languages: intermediate Mandarin Chinese, intermediate Spanish, basic Russian

Academic Appointments

University of Delaware, Newark, Delaware

Jan 2016-current Assistant Professor, Fashion & Apparel Studies (FASH) and Civil & Environmental Engineering (CIEG) Departments

Sept 2014-current Faculty Advisor, Engineers without Borders chapter, ewb-ud.org

Jan 2015-Dec 2015 Adjunct Faculty, Fashion & Apparel Studies Department

Jan 2014-Dec 2015 Adjunct Faculty, Civil & Environmental Engineering Department

Chinese Academy of Sciences (CAS), Scientific Information Center for Resources and Environment, Lanzhou, Gansu, P.R. China

Dec 2009-Dec 2012 Post-Doctoral Research Associate

2009-2010 Chinese Academy of Sciences Visiting Young Scientist Fellow

Michigan Technological University, Department of Mechanical Engineering, Houghton MI

July 2008-June 2009, Amer. Association of Univ. Women Selected Professions Fellow

Aug 2004-Aug 2007 NSF Integrative Graduate Education and Research Trainee

June 2007 ISDEREP (Int'l Sustainable Development Engineering Research Program) Environmental/Technical Research Engineer, La Paz, Bolivia

Aprovecho Research Center, Cottage Grove, OR

May-June 2005 Appropriate Technology Research Engineer

Professional Experience

ICAST (International Center for Appropriate & Sustainable Technology)

Project Manager, March-Nov 2008, Aug 2011-June 2012, Lakewood, CO

- Managed projects infrastructure, building energy efficiency, and renewable energy
- Mentored 13 graduate and undergraduate students and 5+ student design teams from varied disciplines including engineering and anthropology

Graduate Engineering Intern, Sept 2007- March 2008

Clarke-Sather LLC

Sole member-owner, June 2010-Dec 2012, Boulder, CO

- Created and licensed commercial product based sustainability assessment system
- Advancing Colorado's Renewable Energy (ACRE) Grant Program Evaluation for Colorado Department of Agriculture, Sept-Dec 2011

Primary Child Caregiver, Feb-Sept 2011, June 2012-Dec 2015, Newark, DE

Publications, Invited Talks

Peer Reviewed Journal Publications

Clarke-Sather, A. R., Li, Y., and Qu, J. S., 2016, "Lighting Energy Use in Anding District, Gansu Province, China," *Energy for Sustainable Development*, 32, 40-49.

Qu, J., Zeng, J. J., Yan, L., Qin, W., Maraseni, T., Zhang, L., Zhang, Z. Q., and **Clarke-Sather, A.**, 2013, "Household carbon dioxide emissions from peasants and herdsmen in northwestern arid-alpine regions, China," *Energy Policy*, 57, 133-140.

Clarke-Sather, A. R., Hutchins, M. J., Zhang, Q., Gershenson, J. K., and Sutherland, J. W., 2011, "Development of social, environmental, and economic indicators for a small/medium enterprise," Special Issue on "Sustainability, Accounting and Reporting" in the *International Journal of Accounting and Information Management - IJAIM*, 19 (3), 247 - 266.

Nan, Z., Zhao, Z., Liu, X., Saha U. K., Lena Q. M., **Clarke-Sather, A. R.**, 2010, "The Uptake and Translocation of Selected Elements by Cole (Brassica) Grown Using Oasis Soils in Pot Experiments," *Toxicological & Environmental Chemistry*, 92 (8), 1541 - 1549.

Manuscripts Under Review and in Preparation

Clarke-Sather, A. R., Zhang, Q., Gershenson, J. K., and Sutherland, J. W., "Integrating spatially dependent environmental impacts into facility location decision making," *International Journal of Sustainable Engineering*, under revision for resubmission.

Davis, C. J., **Clarke-Sather, A. R.**, Li, Y., and Qu, J. S. "The Impact of Parabolic Solar Cookers on Overall Household Energy for Water Boiling in Rural China," *Energy Policy*, in preparation.

Tabrizi, A., **Clarke-Sather, A.**, and Schumacher, T., "Simplified Life Cycle Assessment of Bridge Joint Rehabilitation Options," *Journal of Bridge Engineering*, in preparation.

Book Chapters & Encyclopedia Entries

Clarke, A., and Gershenson, J. K., 2014. "Life-Cycle Design." In *Mechanical Engineers' Handbook*, Volume II, 1:8. John Wiley & Sons, Inc., Hoboken, New Jersey, pp. 1-41.

Clarke-Sather, A. R., Jenkins, T. L., Haapala, K. R. and Sutherland, J. W., 2010, "Sustainable Production," in *Encyclopedia of Geography*, Warf, B., ed., SAGE Publications, Inc., Thousand Oaks, CA.

Clarke, A. and J. K. Gershenson, 2007, "Design for the Life-Cycle," in *Handbook of Environmentally Conscious Mechanical Design*, Kutz, M., ed., John Wiley & Sons, Hoboken, New Jersey, pp. 67-125.

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Peer Reviewed Conference Proceedings

Masoud, E., Clarke-Sather, A. R., and Righman, J., "Application of Lean Philosophy in Bridge Inspection," The International Bridge Conference 2016, June 4-8, National Harbor, Maryland. Abstract under review.

Clarke-Sather, A. R., Ballard, M. M., Reents, N., Zhang, Q., Mihelcic, J.R., and J. W. Sutherland, "Utilizing Quality Function Deployment for the Environment to Compare the Sustainability Differences between Wastewater Treatment System Designs," 17th CIRP International Conference on Life Cycle Engineering 2010, May 19-21, 2010, Hefei, China.

Clarke, A. R., Zhang, Q., Gershenson, J. K., and J. W. Sutherland, 2008, March 17-19, "Selection of Remanufacturing Facility Locations to Minimize Cost and Environmental Impact," The 15th CIRP International Conference on Life Cycle Engineering, Sydney, Australia.

Clarke, A., Serrar, M. and J. K. Gershenson, 2006, Oct. 3-6, "A Sustainable Design Process Framework based on a Non-Profit Product Design Case Study," IV Global Conference on Sustainable Product Development and Life Cycle Engineering Sustainable Development, São Carlos, Brazil.

Rickli, J. L., **Clarke, A. R.**, Haapala, K. R., Addo, M., Camelio, J. A. and Sutherland, J. W., 2008, Sept. 29-Oct. 1, "Reducing the Environmental and Social Impacts of E-Waste Recovery in Developing Countries through Technology and Policy," Global Conference on Sustainable Product Development and Life Cycle Engineering, Busan, Korea.

Ballard, M. **Clarke, A. R.**, Sather-Knutsen, A., Barkdoll, B. D., Mihelcic, J. R., 2008, May 12-16 "Collaborative International Research: Technology Transfer and Efficiency of Wastewater Treatment Systems in Rural Communities of Bolivia," World Environmental and Water Resources Congress, Honolulu, Hawaii.

Haapala, K.R., Hutchins, M. J., Rivera, J. L., Kumar, V., **Clarke, A. R.**, Eatmon, T. D., Harris, R. A., Durfee, M. H., Mihelcic, J. R., Shonnard, D. R. and J. W. Sutherland, 2007, Sept. 20-22, "Education, Research, and Training Aspects of the Sustainable Futures NSF IGERT Project," ASEE North Midwest Sectional Conference, Houghton, Michigan.

Poster Presentations

Clarke, A., 2006, Sept. 10-13, "Sustainable Product Realization: The Future Scientific Formalism for Global Manufacturing Enterprises in 2025," American Society of Mechanical Engineers - Design Engineering Technical Conference, Philadelphia, Pennsylvania.

Clarke, A., 2006, July 24-27, "Distributed or Centralized Production: Impacts to the Environment, Industry, and the Economy," National Science Foundation Design, Manufacturing and Innovation Grantees Conference, St. Louis, Missouri.

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Policy Reports

Principal author of “The Colorado Department of Agriculture ACRE Program: Success metrics and recommendations for the future.” Report for Colorado Department of Agriculture, information from report utilized by Colorado Governor’s office and the Colorado Governor’s Energy Office.

Technical analysis contributor to American Lung Association in Colorado, Clean Cities Denver Metro Coalition, and the Electric Ride, 2012. “Colorado Electric Vehicle Infrastructure Readiness Plan.”

<http://denvercleancities.org/Colorado%20PEV%20Readiness%20Plan.pdf>

Invited Talks

Clarke-Sather, A. R., 2014. From Here to Sustainability: Involving End Users in Defining & Finding Sustainability Outcomes. University of Delaware Fashion & Apparel Studies Department. Newark, DE, November 10, 2014.

Dentel, S. and **Clarke-Sather, A. R.**, 2014. “Engineers Without Borders at UD: How We Foster Community Engagement.” University of Delaware People, Projects and Partners Lecture Series. Newark, DE, April 28, 2014.

Clarke-Sather, A. R., 2013. Operationalizing Sustainability: Approaches and Applications. University of Delaware Civil and Environmental Engineering Seminar. Newark, DE, November 15, 2013.

Grant Funding (total extramural funding \$281,151)

Sustainable Geotextiles for Transportation Applications from Recycled Textiles

Submitted to: National University Transportation Center Consortium’s Center for Advanced Infrastructure and Transportation (UTC CAIT)

Principal Investigator (PI): Abigail Clarke-Sather, Co-PI: Chris Meehan.

Period of Performance: 9/1/2016-8/31/2018

Award amount: \$59,349 USD

Grant No. DCTR432169

Lean Construction Applications for Bridge Inspection

Submitted to: UTC CAIT

PI: Abigail Clarke-Sather, Co-PI Jennifer McConnell.

Period of Performance: 6/1/2016-5/31/2017.

Award amount: \$59,663 USD

Grant No. DTRT13-G-UTC28

Bridge Retrofit Replacement Decisions: Tools to Assess Sustainability and Aid Decision Making

PI: Abigail Clarke-Sather, Co-PI Thomas Schumacher.

Submitted to: UTC CAIT

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Period of Performance: 1/1/2015-12/31/2015.

Award amount: \$45,139 USD

Grant No. DCTR432173

Integrating Service-Learning Modules to Help Students Apply Learning about Sustainability in the Minor of Sustainable Infrastructure classes

PI: Abigail Clarke-Sather Co-PI: Thomas Schumacher.

Submitted to: University of Delaware Center for Teaching and Assessing Learning

Period of Performance: 7/1/2014-6/30/2015.

Award Amount: \$9,000 USD

Environmental and Social Life Cycle Assessment of the Energy Choices and Technologies for Rural Populations in Arid Regions of Gansu and Ningxia, China

PI: Abigail Clarke-Sather, Co-PI: Jiansheng Qu.

Submitted to: National Natural Science Foundation of China

Period of Performance: 12/1/2010- 11/30/2012

Award Amount: 500,000 RMB (over \$77,000 USD)

Environmental Life Cycle Assessment and Efficient Use of Energy Resources

PI: Abigail Clarke-Sather, Co-PI: Jiansheng Qu.

Submitted to: Chinese Academy of Sciences

Period of Performance: 12/1/2009- 11/30/2010

Award Amount: 200,000 RMB (over \$31,000 USD)

Submitted Grant Funding

Sustainable engineered textiles manufacturing from recycled clothing

Submitted to: University of Delaware Research Foundation – Strategic Initiatives.

PI: Abigail Clarke-Sather. Co-PI: Erik Thostenson.

Award amount: \$45,000.

Pending.

Integrated Research Team for “Wearables for Healthy Living” and the “Well Garments to Promote Motor and Cognitive Development for Infants at Risk” project.

Submitted to: Delaware INBRE (IDeA Networks of Biomedical Research Excellence)

PI: Michele Lobo. Senior Personnel: Huantian Cao, Abigail Clarke-Sather.

Submission date: 2016

Rated 2nd Quintile, not awarded.

Landfill Diversion Strategies for Textiles in Municipal Solid Waste

Submitted to: Environmental Research & Education Foundation

PI: Abigail Clarke-Sather. Co-PIs: John Bernard, Huantian Cao, Marsha Dickson.

Submission date: 2016

Selection committee review, not awarded.

Snuggle Time Well Garment.

Submitted to: NEPDC New England Pediatric Device Consortium.

PI: Abigail Clarke-Sather. Co-PI: Michele Lobo.

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Submission date: 2016

Call back for further questions, not awarded.

Improving Nursing Clothing for Mothers to Increase Breastfeeding adoption and duration

Submitted to: Robert Wood Johnson Foundation

PI: Abigail Clarke-Sather. Co-PI: Michele Lobo.

Submission date: 2016

Not awarded.

Cyber Civil Infrastructure Management via Collaborative Mobile Imaging and Reconstruction

Submitted to: National Science Foundation

PI: Jingyi Yu. Co-PIs: Abigail Clarke-Sather, Thomas Schumacher, Chien-Chung Shen.

Submission date: 2014

Rated competitive, i.e., top 25%, not awarded.

Graduate Students

Arsha Tabrizi, M.S. Civil Engineering, August 2016. *"Sustainability Costing to Aid Bridge Management Decision Making: A Case Study on Bridge Deck Expansion Joint Replacements."*

Emal Masoud, M.S. Civil Engineering, expected May 2017. University of Delaware.

Ahmed Sabab, M.S. Fashion and Apparel Studies, expected May 2018.

Undergraduate Research Supervised

Isabella Aswadi, B.S. in Fashion Merchandising and Apparel Design (class of 2018). Volunteer researcher.

Eric Johnson, B.S. Civil Engineering (class of 2018). Directed Research Credit.

Alison Treglia, B.S. Environmental Engineering (class of 2017). Volunteer researcher.

Xiaolun Guo, B.S. Environmental Engineering (class of 2018) Faculty mentor for 2016 University of Delaware Service Learning Fellow for "Cool Spring Park Redesign."

Courses Taught

- Spring & Fall 2016 FASH 330 Merchandise Planning, computer applications related to mathematical concepts used in developing merchandise budgets, students partner with non-profits to assess and improve their retail business activities.
 - Media coverage from UDaily "Philanthropy in fashion" March 16, 2016
- Spring FASH 367-011 Thrift Shop (re)Workshop, designed course as a partnership with Goodwill of Delaware's Recycled Goods Manufacturing Initiative for students to do sustainability assessment, innovation, and business plan development with Goodwill's discarded textile waste stream.

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- Spring 2015 and 2016, Spring 2014 (co-instructor) CIEG 465 Global Sustainable Engineering, a requirement for the Environmental Sustainability minor
 - Undergraduates apply sustainable technologies for water, construction, energy, and waste in a design project for an international or local community
 - Media coverage from the Delaware News Journal “UD students aid in planning of Tilton Park upgrade” March 8, 2014 and UDaily “Engineers Without Borders students develop renovation plan for park” March 24, 2014
- Winter 2015 Instructor for CIEG 467-011 Life Cycle Assessment
 - Developed new curriculum using Life Cycle Assessment (LCA) SimaPro software, class collaborated with City of Newark Public Works Department
- Fall 2014 Co-instructor for CIEG402 Introduction to Sustainability Principles in Civil Engineering
 - Principle investigator on grant to create and teach a LCA module using SimaPro software with a student service learning project for local & international non-profits (e.g. Foodbank of Delaware, Universal Outreach Foundation)

Honors and Awards

2014 University of Delaware Carnegie Elective Community Engagement Classification Task Force Exemplary Achievement in Community Service Certificate

2009-2010 Chinese Academy of Sciences Visiting Young Scientist Fellow

2008 co-author of Corporate Register’s Best Small/Medium Enterprise (SME) Sustainability Report for Ecologic Designs, Inc.

2008-2009 American Association of University Women Selected Professions Fellow

2008 Jurlique Scholarship to Lifestyles of Health and Sustainability (LOHAS) Forum

2006 NSF Design, Service, and Manufacturing Grantees Conference Student Travel

Service

Faculty Advisor of University of Delaware Engineers without Borders chapter

Recycled Goods Manufacturing Initiative for Goodwill of Delaware Collaborator

Organizer of student poster session entitled “Recycled Goods Manufacturing Initiative for Goodwill” poster session April 27, 2015

Co-organizer of student poster session entitled “Community Engagement in Engineering” poster session December 5, 2014

Peer Reviewer: Atmospheric Pollution Research, International Journal of Sustainability, International Journal of Production Research, Journal of Environmental Management, Journal of Infrastructure Systems, Textile and Clothing Sustainability Journal

Session Chair and Peer Reviewer - 17th CIRP Life Cycle Engineering Conference