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PhD Candidate, University of Michigan School for Environment and Sustainability

Focus: Sustainable Adaptation in Food-Energy-Water Systems

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### **Education**

PhD in Resource Policy and Behavior at University of Michigan School for Environment and Sustainability –  
Graduation May '24

Advisor: Joshua Newell

Dissertation: The metabolism of urban agriculture

MS Ecological Sciences and Engineering, Natural Resources Social Science, Purdue Univ.—August '19

Advisor: Zhao Ma

Committee Members: David Yu, Morey Burnham, Zoe Nyssa

Thesis: Mixed-methods analysis of agricultural adaptation to water stress

BS Environmental and Ecological Engineering, Purdue University—May '17

Minor: Environmental Policy and Politics, Natural Resources and Environmental Science

### **Publications and Presentations**

#### **Peer-reviewed Publications:**

1. **Hawes, J. K.**, Gounaridis, D., & Newell, J. P. (2022). Does urban agriculture lead to gentrification? *Landscape and Urban Planning*, 225, 104447. <https://doi.org/10.1016/j.landurbplan.2022.104447>
2. Killion, A. K., Ostrow Michel, J., & **Hawes, J. K.** (2022). Toward Identifying Sustainability Leadership Competencies: Insights from Mapping a Graduate Sustainability Education Curriculum. *Sustainability*, 14(10), 5811. <https://doi.org/10.3390/su14105811>
3. **Hawes, J. K.**, Burnham, M., du Bray, M. V., Hillis, V., Ma, Z., & Running, K. (2022). Social Vulnerability to Irrigation Water Loss: Assessing the Effects of Water Policy Change on Farmers in Idaho, USA. *Environmental Management*. <https://doi.org/10/gnz5j4>
4. **Hawes, J. K.**, Johnson, R., Payne, L., Ley, C., Grady, C. A., Domenech, J., Evich, C. D., Kanach, A., Koeppen, A., Roe, K., Caprio, A., Puente Castro, J., LeMaster, P., & Blatchley, E. R. (2021). Global Service-Learning: A Systematic Review of Principles and Practices. *International Journal of Research on Service-Learning and Community Engagement*. <https://doi.org/10/gnzbpv>
5. Kirby, C. K., Specht, K., Fox-Kämper, R., **Hawes, J. K.**, Cohen, N., Caputo, S., Ilieva, R. T., Lelièvre, A., Ponizy, L., Schoen, V., & Blythe, C. (2021). Differences in motivations and social impacts across urban agriculture types: Case studies in Europe and the US. *Landscape and Urban Planning*, 212, 104110. <https://doi.org/10/gjsqba>
6. Caputo, S., Schoen, V., Specht, K., Grard, B., Blythe, C., Cohen, N., Fox-Kämper, R., **Hawes, J.**, Newell, J., & Ponizy, L. (2020). Applying the Food-Energy-Water Nexus approach to urban agriculture: From FEW to FEWP (Food-Energy-Water-People). *Urban Forestry & Urban Greening*, 126934. <https://doi.org/10/ghr386>
7. Yu, D. J., Schoon, M. L., **Hawes, J. K.**, Lee, S., Park, J., Rao, P. S. C., ... Ukkusuri, S. V. (2020). Toward General Principles for Resilience Engineering. *Risk Analysis*, risa.13494. <https://doi.org/10.1111/risa.13494>
8. Running, K., Burnham, M., Wardropper, C., Ma, Z., **Hawes, J. K.**, & du Bray, M. V. (2019). Farmer adaptation to reduced groundwater availability. *Environmental Research Letters*. <https://doi.org/https://doi.org/10.1088/1748-9326/ab4ccc>

9. Alwang, A., Busse, M., Caprio, A., Fenton, M., **Hawes, J.K.**, Kanach, A., McElfresh-Sutton, A. (2017) Water Supply in Developing Countries: A Reflective Essay. *Purdue Journal of Service Learning*, 4(1).
10. **Hawes, J. K.**, Conkling, E. N., Casteloes, K. S., Brazeau, R. H., Salehi, M., & Whelton, A. J. (2017). Predicting contaminated water removal from residential water heaters under various flushing scenarios. *Journal - American Water Works Association*, 109(8), E332–E342.  
<https://doi.org/10.5942/jawwa.2017.109.0085>

**Publications In-Review:**

1. Busse, M., **Hawes, J.K.**, & Blatchley, E.R. Comparative Life Cycle Assessment of Direct and Indirect Solar Water Disinfection Processes in Low-income Settings. Submitted to *Journal of Cleaner Production*. Submitted to *Environmental Science and Technology*: April 2022
2. Fox-Kämper, R., Kirby, C. K., Specht, K., Cohen, N., Ilieva, R. T., Caputo, S., Schoen, V., **Hawes, J. K.**, Ponizy, L., Béchet, B. The role of Urban Agriculture in Food-Energy-Water-Nexus policies. Insights from Europe and the U.S. Submitted to *Land Use Policy*: October 2021.

**Publications In-Revision:**

1. **Hawes, J.K.**, Ma, Z., Burnham, M., Yu, D. Employing decision theory to inform agent-based modeling of adaptation to water scarcity. Submitted to *Ecological Modeling and Software*. Status: Rejected and Under Revision

**Book Reviews:**

1. **Hawes, J. K.**, Erwin, A., McWherter, B., Nixon, R., Popovici, R., Rathjen, M., & Ma, Z. (2019). A Review of Grassroots Global Governance. *Society & Natural Resources*, 32(11), 1330–1332.  
<https://doi.org/10.1080/08941920.2019.1602239>

**Invited Presentations:**

1. **Hawes, JK.** February 2022. Invited panel moderator: Water Systems. Michigan University-Wide Sustainability & Environment Initiative: Annual Conference.
2. **Hawes, JK.** November 2021. Invited guest lecture: Decolonizing Sustainability. University of Michigan Course: Environ 207, Sustainability and Society.
3. **Hawes, JK,** Gounaridis, D., Goldstein, B., Newell, JP. October 2021. Invited guest lecture: Urban Agriculture: Good for Cities, People, Planet? University of Michigan Course: SEAS 517, Urban Sustainability.
4. **Hawes, JK.** July 30, 2020. Climate Change: Part of the Great Decisions speaker series at the Indiana Council on World Affairs.
5. **Hawes, JK,** Kanach, A. August 2018. Invited guest lecture: How we got here: A look back at historical motivations and trends shaping the Water Supply in Developing Countries team. Purdue Univ. Course: CE 597.
6. **Hawes, JK.** 2016. Safe Water in Developing Countries: Rethinking Water Supply from the Lab to Las Canas. September Presentation to the Environmental and Ecological Engineering External Advisory Council, Purdue University.
7. Ma, Z, **Hawes, JK,** Clarke, M, Nixon, R, Domenech, J. Oct. 2017. Invited guest lecture: Introduction to Natural Resources Social Science. Purdue Univ. Course: Introduction to Nat. Resources and Environmental Science.
8. Schirm, V, **Hawes, JK,** Russel, M. September 2018. Invited guest lecture: Deep Leadership and Applying for International Scholarships and Grants. Purdue Univ. Course: EEE 290, Professional Development Seminar.

**Selected Presentations:**

1. **Hawes, JK,** Dimitris Gounaridis, Benjamin Goldstein, Joshua P. Newell. Spatial metabolism of

- urban agriculture. American Association of Geographers Annual Meeting, February 2022, online. Oral research presentation.
2. **Hawes, JK**, Dimitris Gounaridis, Benjamin Goldstein, Joshua P. Newell. Resource-Efficient Urban Agriculture. Policymaker Webinar – FEW-meter project, October 2021, online. Oral extension presentation.
  3. **Hawes, JK**, Benjamin Goldstein, Dimitris Gounaridis, Joshua P. Newell. A Framework for Multi-dimensional Assessment of Urban Agriculture at the City Scale, August 2021, online. Oral research presentation.
  4. **Hawes, JK**, Dimitris Gounaridis, Benjamin Goldstein, Joshua P. Newell. Environmental Footprint of Urban Agriculture. Farmer/Gardener Outreach Workshop – FEW-meter project, April 2021, online. Oral extension presentation.
  5. **Hawes, JK**, Joshua P. Newell. Spatial Planning for Hybrid Infrastructures: The case of urban agriculture. American Association of Geographers Annual Meeting, April 2021, online. Oral research presentation.
  6. **Hawes, JK**, Zhao Ma, Rebecca Nixon, and Morey Burnham. Adaptation, Tradeoffs, and Cross-cultural Value Systems. American Association of Geographers Annual Meeting, April 2020, online. Oral research presentation.
  7. **Hawes, JK**, Benjamin Goldstein, Dimitris Gounaridis, Joshua P. Newell. Evaluating the multi-dimensional sustainability of urban agriculture through comparative case study. MUSE Annual Conference, February 2020, Ann Arbor, MI. Oral research presentation.
  8. **Hawes, JK**, Zhao Ma, Rebecca Nixon, and Morey Burnham. Tradeoffs in Adaptation Decision Making: Testing a new analytical lens in the Eastern Snake Plain of Idaho. Sustainability and Development Conference, October 2019, Ann Arbor, MI. Oral research presentation.
  9. **Hawes, JK**, Rebecca Nixon, Zhao Ma, and Morey Burnham. Multi-scalar trade-offs in adaptation decision-making in the Eastern Snake River Plain, Idaho and Khyber Pakhtunkhwa, Pakistan. International Symposium on Society and Resource Management, June 2019, Oshkosh, WI. Oral research presentation.
  10. **Hawes, JK**, Zhao Ma, David Yu, and Morey Burnham. Understanding farmer adaptation to water scarcity and climate change: Improving decision-making in agent-based models of coupled natural and human systems. American Association of Geographers, Annual Conference, April 2019, Washington, DC. Oral research presentation.
  11. **Hawes, JK**, Zhao Ma, David Yu, and Morey Burnham. Using empirically-grounded agent-based modeling to assess decision-making theories for farmer adaptation to water scarcity. International Symposium on Society and Resource Management, 19 June 2018, Snowbird, UT. Oral research presentation.
  12. **Hawes, JK**, Zhao Ma, David Yu, and Morey Burnham. Understanding farmer adaptation to water scarcity and climate change: Improving decision-making in agent-based models of coupled natural and human systems. American Association of Geographers, Annual Conference, 11 April 2018, New Orleans, LA. Oral research presentation.
  13. **Hawes, JK**, Whelton, AJ. Premise Plumbing Decontamination: New Lessons from the Field and Purdue University's Pilot-Scale Testing Facility. Water Quality Technology Conference, 15 Nov, 2016, Indianapolis, IN. Oral research presentation.
  14. **Hawes, JK**, Caprio, A, Busse, M. Water Supply in the Dominican Republic. Innovation for International Development Lab Exposition, 1 April, 2017. Awarded Top Poster Presenter.
  15. **Hawes, JK**, Blatchley, E. Direct and Indirect UV Disinfection: Life Cycle Impacts for Use in Developing Countries. Summer Undergraduate Research Fellowship Symposium, 4 August, 2016. Awarded Top Oral research presentation.

### **Awards and Honors**

**Outstanding Graduate Student Instructor for the Program in the Environment** – University of Michigan, PiTE– May 2021

**Chappelle Fellow**—Purdue University—March 2017

- Awarded to a small group of graduate applicants from Purdue University, the Charles C. Chappelle Award is selected on the basis of character, intellectual ability, and promise of degree attainment.

**Black and Veatch, Building a World of Difference Award Winner**—American Water Works Association—June 2016

- Awarded to one student nationally, the Building a World of Difference Award recognizes academic and research achievement in the drinking water field.

**Outstanding Senior Student**—Purdue University, Division of Environmental and Ecological Engineering—April 2017

**I2D Expo Top Poster Presenter**—Purdue University, Innovation for International Development—April 2017

**Summer Undergraduate Research Fellowship Top Research Presenter** —Purdue University—August 2016

**Beering Scholar**—Purdue University—April 2013

- Awarded to between 8 and 10 incoming freshmen, the Steven C. Beering Award honors academic achievement, service to community, and other exceptional performance prior to entering the University.

**Eagle Scout**—Boy Scouts of America—October 2012

### **Fundraising and Grant History (successful lead author experience only)**

1. **Graduate Student Travel Grant** – University of Michigan Rackham Graduate School & School for Environment and Sustainability - \$1,000 – Nov. 2019, Nov. 2021
2. **Graduate Student Research Grant** – University of Michigan Rackham Graduate School & School for Environment and Sustainability - \$1,500 – Jan. 2021
3. **Ecological Sciences and Engineering Symposium Fundraising** – *Sought from donors as chair of event* - \$21,000 – 2018-2019
4. **Purdue Climate Change Research Center Travel Grant**—Purdue Climate Change Research Center—\$1,500—Nov. 2018
5. **Blosser Environmental Travel Grant** – Purdue University—\$1,500 – Nov. 2018
6. **Anderson Rotary Club – Project Supplemental Support Grant** – Anderson, IN Rotary Club—\$1,000— August 2018
7. **Purdue Climate Change Research Center Travel Grant**— Purdue Climate Change Research Center—\$1,500—Nov. 2017
8. **Andrews Environmental Travel Grant**—Purdue University—\$1,500—Nov. 2017
9. **Hydrologists Helping Other Grant: *sought on behalf of Water in the Dominican Republic team***—Purdue University, Department of Earth, Atmospheric, and Planetary Sciences—\$20,000—March 2017
10. **Purdue Service-Learning Grant: *sought repeatedly on behalf of Water in the Dominican Republic team***—Purdue University, Center for Instructional Excellence – Received six times between 2015 and 2018—\$1,500 each time

### **Academic Service**

**SEAS Specializations Committee – Member** – Calendar Year 2022

**SEAS Chief Diversity Officer Hiring Committee – Member** – July 2021

**SEAS DEI Student Support position Hiring Committee – Member** – May 2021

**SEAS Doctoral Organizing Committee – Chair** – Calendar Year 2021 – Responsibilities: Lead Doctoral Organizing Committee, facilitating new initiatives in professional development, community-building, outreach, and DEI. Also responsible for overseeing DOC budget and serving as PhD community liaison.

**SEAS Doctoral Organizing Committee – Seminar Chair** – Calendar Year 2020 – Responsibilities: Oversaw and facilitated the planning and implementation of weekly professional development and community-building seminars for the SEAS PhD community. Also served on the Doctoral Organizing Committee, involved with COVID-19 response, DEI efforts, and annual event planning

**SEAS Fall 2020 COVID Response Committee – Student Member** – Summer 2020 – Responsibilities: Served as PhD student representative and advocate during planning

**Ecological Sciences and Engineering Symposium – Co-Chair** – Fall 2017 to Spring 2019 – Responsibilities: Oversaw and facilitated the planning, design, and implementation of an annual symposium for interdisciplinary environmental scholars, included fundraising and oversight of a budget exceeding \$20,000

**Organized Session – Lead Author and Organizer** – ISSRM 2019 (June 2019) – Session title: Examining multi-scalar adaptation to social-ecological change in food-energy-water systems (FEWS)

**International Association for Society and Natural Resources (IASNR) Student Affairs Committee – Professional Development Committee** – Fall 2017 to June 2019 – Responsibilities: Support planning and execution of annual student professional development seminar at IASNR annual meeting (ISSRM)

**Water in the Dominican Republic Service Learning Project – Project Manager (Spring 2017) and Design Lead (Spring 2016 - Spring 2018)** – Responsibilities as Project Manager: Generation of reports to funders, coordination of internal reports between committees and leadership, planning and execution of committee meetings, and development of semester plans. Responsibilities as Design Lead: Many of the above management tasks at the sub-team level, in addition to responsibility for ultimate design decisions, in-country design and installation coordination, and team R&D planning and assessment

### **Employment History**

**Evaluation Consultant**—Voters Not Politicians—January to June 2022—Supervisor: Dr. Connie Cook

- Designed and led an evaluation process centered on the redistricting outreach efforts conducted by VNP between 2019 and 2021.
- Cleaned and analyzed submissions to the public comment portal. Included sentiment analysis across space and time.
- Produced written deliverables on best practices in redistricting for non-profits and government.

**Graduate Research Assistant** —Urban Sustainability Research Group—School for Environment and Sustainability, University of Michigan—September 2019 to Present—Advisor: Joshua Newell

- Dissertation research focus: Investigation of the ripple effects across urban social and material systems that result from changes to one selected resource provisioning system. Studying this via a series of case studies of urban agriculture. Conducting a life cycle assessment of urban agriculture in seven case study cities in US and Europe. Employing empirical data collected by urban farmers and spatial data from secondary sources to assess the potential for scaling in case study cities, as well as the long-term implications of urban agriculture on the urban metabolism of the city.

**Graduate Student Instructor**—Environ 207: Society and Sustainability—Program in the Environment, University of Michigan—Fall 2020, Fall 2021—Lead instructor: Joshua Newell

- Responsible for teaching three discussion sections and grading all course materials.
- In Summer 2021, participated in a “Decolonizing Curriculum” initiative and led significant overhaul of course syllabus.
- Taught course online in Fall 2020, In-person in Fall 2021.

**Graduate Research Assistant** —Human Dimension of Natural Resources Lab—Forestry and Natural Resources as member of Ecological Science and Engineering Interdis. Grad. Program, Purdue University—May 2017 to August 2019—Advisor: Zhao Ma

- Primary research focus: Investigated the social and cognitive dimensions of water scarcity adaptation among farmers in the Eastern Snake River Plain of Idaho. Conducted three primary projects in collaboration with researchers at Idaho State University and Purdue:
  - Parameterization of agent-based modeling using social cognitive theory and secondary data in the context of adaptation in agriculture;
  - Qualitative investigation of adaptation decision making and the role of tradeoffs in decision making; and
  - Quantitative characterization of the vulnerability of farmers to sudden onset water scarcity and analysis of the drivers of such vulnerability.

**Undergraduate Research Assistant** —Summer Undergraduate Research Fellowship: Functionality and Life-Cycle of Analysis of Four Direct and Indirect UV Disinfection Technologies for Use in Developing Countries — June 2016 to July 2017 – Dr. Ernest “Chip” Blatchley—Purdue University

- Led Life-Cycle Analysis (LCA) portion of two-part project researching the functionality and environmental and economic sustainability of UV disinfection technologies in developing countries. To assess life cycle impacts, conducted LCA using existing functionality data.

**Undergraduate Research Assistant** —Biocide Degradation of HDPE pipe, Leaching of Contaminants from PEX pipe, and Pilot-Scale Decontamination of Premise Plumbing Systems— September 2014 to January 2017 – Dr. Andrew Whelton—Purdue University

- Premise Plumbing Decontamination: Led project laying foundation for science-based premise plumbing flushing guidance. Publication focused on premise plumbing flow-rate analysis and pilot-scale tests of flushing fully contaminated water heaters to determine flushing time required to make a premise plumbing system safe for use after large-scale drinking water contamination events. Analyzing model presented by Casteloes in journal of the Royal Society of Chemistry. Results presented at AWWA Annual Conference and Exhibition, (ACE) 2016 and published in

Journal AWWA, August 2017.

- Role of Water Temp. and pH in PEX Drinking Water Quality Impacts: Co-led PEX pipe exposure experiment to identify and determine concentrations of leachates from drinking water pipe. Results presented at AWWA ACE, 2016.
- Biocide-Induced Aging of HDPE Cooling Water Pipe: Private Report Submitted (January 2016): Constructed and operated HDPE pipe loop to investigate the effects of bromine and chlorine on cooling tower plumbing systems.

**Sustainability Intern**—Clerical work and research in Sustainability at the University Level—March 2015 to July 2016 – Global Sustainability Institute – Dr. Ron Turco—Purdue University

**Student Environmental Technician** – Jan 2017 to Aug 2017  
Purdue University Radiological and Environmental Management

**Summer Intern**—Design Engineering—May 2014 to August 2014  
LMC Workholding, Logansport, IN

**Summer Intern**—Robotics Research and Development—June 2013 to August 2013  
Myers Spring Company, Logansport, IN

### **Languages and Applied Skills**

*Languages:*

English – Native

Spanish – Limited working proficiency spoken, working proficiency written

Levels of expertise divided into categories of Basic, Moderate, and Advanced. “Basic” refers to familiarity with the tool or method equivalent to expertise approximately resembling an introductory course. “Moderate” refers to familiarity and skill with the tool or method beyond that which is gained through an introductory workshop or course, most often due to experience gained through research or involvement in a team project requiring creative application of the tool or method. “Advanced” refers to extensive application of the method or tool in a research context, requiring expertise beyond that which is traditionally associated with the tool or method (e.g. implementation of multiple imputation in R or generation of novel decision-making algorithms in Agent-Based modeling). Further details provided under each item as necessary and examples of work available upon request.

*Methodological Expertise:*

- Quantitative Social Science:
  - Household survey development – Advanced
    - Experience in industrialized and industrializing settings
  - Fuzzy Cognitive Modeling – Moderate
  - Delphi Consensus Method – Basic
  - Advanced statistical analysis – Multiple Imputation, Linear Regression, Structural Equation Modeling, Cluster Analysis, Descriptive Analysis – Experience varies by method
- Qualitative Social Science:
  - Semi-structured interviews – Advanced
    - Development and execution

- Computational Social Science:
  - Agent-based modeling – Advanced
- Spatial Science:
  - Spatial multi-criteria analysis – Advanced
  - Manual and automated remote sensing – Moderate
- Systematic Literature Review – Moderate
- Workshop Design and Implementation – Moderate
- Analytical Environmental Chemistry – Moderate
  - Methods development and use experience with LCMS, Spectrophotometry, Organic Carbon analysis, and traditional field-based water testing techniques.
- Field Ecology – Basic
  - Sampling, surveying, and taxonomy methods developed in advanced population ecology coursework – no formal research experience

*Software Expertise:*

- R – Statistical Analysis – Advanced
- NetLogo – Agent-Based Modeling – Advanced
- Microsoft Office Suite (including Word, PowerPoint, Excel, Publisher, and Access) – Advanced
- ArcGIS (Pro) and QGIS – Spatial Analysis – Advanced
- Slack – Project Communication – Moderate
- NVivo – Qualitative Content Analysis – Moderate
- SimaPro – Life Cycle Assessment – Moderate
- Basecamp – Project Management – Moderate
- Stata – Statistical Analysis – Moderate
- Rayyan – Abstract Review – Moderate
- Google Sites and WordPress – Website Design – Moderate
- Adobe Creative Suite (including InDesign, Photoshop, and Illustrator) – Graphic Design – Moderate
- Python – Statistical and Spatial Analysis – Basic to Moderate
- MATLAB – Computational Analysis – Basic
- Stella – Systems Modeling Platform – Basic

**Volunteer Service**

**Skype a Scientist** – K-12 Science outreach and instruction – Online – Fall 2019 to Present

**ProjectGrow** – Urban Community Gardens – Ann Arbor, MI – Fall 2021

**Bucket 100 & Cover Indiana Rider**— Charity bike tours benefitting Habitat for Humanity—Purdue University—October 2013 to June 2019

**Wabash River Enhancement Corporation** – May 2015 to June 2019

**Boiler Out—Purdue International Volunteer Organization**—Purdue University—May 2016 to May 2017

**Engineering Projects in Community Service (EPICS)**— August 2013 to December 2014

**Special Olympics Coach (Basketball and Track)**—Cass County—May 2011 to December 2013

**Other Leadership Experience**

Student Sustainability Council Vice-President—Fall 2015 to Spring 2017

First Year Engineering Student Advisory Council President - Fall 2015 to Fall 2016 (FYESAC Treasurer Fall



2014-Fall 2015)

Paint Crew Advisory Board (Men's Basketball Student Section)—Fall 2014 to Spring 2017

Beerling Scholar Newsletter Editor and Coordinator—Spring 2013 to Spring 2017