

Susan Spierre Clark, Ph.D.

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EDUCATION

- 2013** **Ph.D., Sustainability**, Arizona State University
Dissertation: Examining a Sustainable Approach to Global Climate Policy
- 2008** **M.S., Earth Science** (Geochemical Systems), University of New Hampshire
Thesis: Trends in Extreme Precipitation Events for New England
- 2006** **B.S., Atmospheric Science**, University at Albany
Minor in Geography, Earned a GIS certificate

APPOINTMENTS

Please note that * indicates that parental leave was taken during this time.

- 2023- **Edward J. Kikta Jr. Innovation Professor** of Experiential Learning, UB
2020-* **Assistant Professor**, Department of Environment & Sustainability, UB
2019-2020* **Director, Sustainability Urban Environments Initiative**, College of Arts & Sciences, UB
2017-2019 **Policy, Planning & Sustainability Scientist**, RENEW Institute, UB
2013-2017 **Vice President**, Experiential Sustainability Ethics Training Games, Inc.
2014-2017 **Research Assistant Professor**, School of Sustainable Engineering, ASU
2014-2017 **Senior Sustainability Scientist**, Global Institute of Sustainability, ASU
2014-2017 **Affiliate Scholar**, Consortium for Science, Policy, and Outcomes, ASU
2012-2014 **Faculty Associate**, School of Sustainability, ASU
2013-2014 **Post-Doctoral Scholar**, School of Sustainable Engineering, ASU
2010-2013 **Graduate Research Assistant**, School of Sustainable Engineering, ASU
2009 **Research Associate**, Clean Air-Cool Planet, Portsmouth, New Hampshire
2006-2008 **Graduate Teaching Assistant**, Department of Geography, UNH
2006-2008 **Graduate Research Assistant**, Climate Change Research Center, UNH
2006 **Intern**, New York State Department of Environmental Conservation, Albany
2005 **Intern**, National Weather Service, Albany, NY

PUBLICATIONS

Please note that Spierre is my maiden name.

Legend: I use the following notations across my publications to denote types of collaborators: #Postdoctoral Scholar; *Graduate student; ~Undergraduate student; ^Community or government

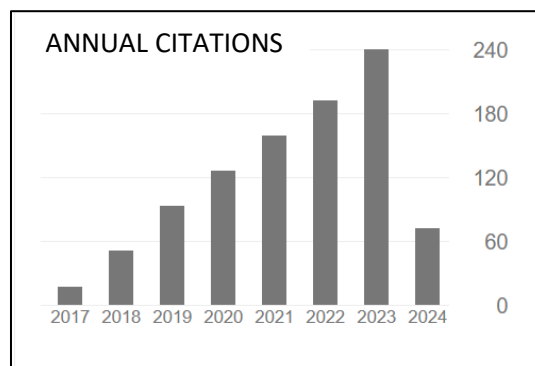
Authorship and ordering: My research is collaborative and aimed at addressing challenges at the

intersection of community resilience, critical infrastructure, climate adaptation, sustainability education, and sustainability behavior and practice. I co-author papers with colleagues and graduate students who actively participate in the work. In papers where I appear as the first author, I have taken the lead in study design and writing results. I assume second or third author on works led by colleagues or students, where they have primarily generated the research ideas and I have served as co-investigator and writer, or mentor in research and writing.

Citations: A summary of yearly growth in citations from [Google Scholar](#) is provided to the right, and summarized below:

- Total citations as of 05/07/2024: 1033
- h-index: 13 (all) and 10 (since 2019)
- i10-index: 14 (all) and 10 (since 2019)

Journals: My research is problem-oriented and therefore draws on and speaks to many scholarly communities, including environmental sciences and policy, natural hazards and resilience, emergency management, sustainability sciences, and education. My journal choices are typically based on the audience the research is intended to impact.



Peer-Reviewed Publications:

A24. *Holtan, M.T., **Clark, S.S.**, *Conklin, D., Rajkovich, N.B., Habeeb, D., Williams, A., Aller, D., ^Hondula, D.M., Coseo, P., Hamstead, Z., Chester, M. (2024). Evaluation for extreme heat: Challenges and opportunities in adaptation planning. Under Review at the *Journal of Environmental Planning and Management*

Significance: An analysis of 65 U.S. heat adaptation plans was conducted to investigate if evaluation and monitoring of extreme heat mitigation and adaptation strategies were being planned for, and if so, what indicators were being used, and how well the evaluation plan aligned with the overarching heat adaptation planning goals. An evaluation framework and general recommendations to help guide and support evaluation and monitoring efforts in the heat planning process are provided.

Journal info: Impact factor: 3.9; JCI: 0.86; JCI Ranking: 17/62 for Development Studies; 18/54 for Regional & Urban Planning (Q2)

A23. *Peterson, S.K., **Clark, S.S.**, Shelly, M.A., & *Horn, S. (2024). Assessing the household burdens of infrastructure disruptions in Texas during Winter Storm Uri. *Natural Hazards*. DOI: 10.1007/s11069-024-06480-w

Significance: Guided by the Capabilities Approach framework, a survey of Texan households (n= 832) was conducted to identify outage characteristics and capability losses for different household types, as well as the social burdens that those disruptions posed to households. Results indicate that longer and constant electricity outages resulted in more severe social impacts across all measures. Low-income households, households with children, and households with disability challenges also suffered more severe objective burdens, although subjective results for these households were mixed. Prior experience with a prolonged outage reported smaller reductions in well-being during the storm than other households, despite not showing any difference in objective measures. Produced as a result of NSF award 2128030.

Journal info: Impact factor: 3.7; JCI:0.82; JCI Ranking: 89/249 for Geosciences, Multidisciplinary (Q2)

A22. #Stewart, K., & **Clark, S.S.** (2023). Teaching Climate Change and Sustainability Across Disparate Ideologies. Accepted by *Journal of Sustainability Education*

Significance: This article highlights our experience teaching a course, Climate Change and Sustainability, in which we encountered disruptive objections to our lessons from students who believe climate change is happening and desperately want action. However, the all-or-nothing stance of these students stifled conversation, and their lack of engagement with various topics kept them uninformed. To address these issues, we recommend structuring classroom debates around consensus-building activities to practice solution-oriented communication.

Journal info: JSE is a peer-reviewed, open-access trans- and interdisciplinary e-journal that has a particular focus on education and sustainability topics housed by the Prescott College PhD Program in Sustainability Education. No metrics available.

- A21. **Clark, S. S.,** *Peterson, S. K., Shelly, M.A., & Jeffers, R. F. (2023). Developing an equity-focused metric for quantifying the social burden of infrastructure disruptions. *Sustainable and Resilient Infrastructure*, 8(sup1), 356-369.

Significance: This article outlines the process of developing an equity-focused resilience metric that captures the social consequences of infrastructure service disruptions on households. Theoretically grounded in the Capabilities Approach theory, this metric focuses on estimating the burden of post-event adaptations taken by households to maintain their basic capabilities (e.g., ability to access food and water) and fulfill important household functionings (e.g., maintaining health and well-being). The paper discusses future applications of the metric to inform resilient infrastructure investments and resilience planning.

Journal info: Impact factor: 5.9; JCI: 1.35; JCI Ranking: 13/179 for Engineering, Civil (Q1)

- A20. **Clark, S.S,** *Peterson, S.K., Rivera-Gutiérrez, R., *Zambrana-Rosario, A. C., & Shelly, M.A. (2022). Impact of Infrastructure Disruptions on Puerto Rican Household Capabilities, Health, and Well-Being (Natural Hazards Center Public Health Disaster Research Report Series, Report 21). Natural Hazards Center, University of Colorado Boulder. <https://hazards.colorado.edu/public-health-disaster-research/impact-of-infrastructure-disruptions-on-puerto-rican-household-capabilities-health-and-well-being>

Significance: This study examines how infrastructure service interruptions place a burden on households by impeding their capabilities, such as accessing drinking water, storing and preparing food, removing wastewater, and cooling or heating their homes. Because these household-level impacts of infrastructure disruptions are currently unmeasured, they are not adequately considered in infrastructure provision or public health planning. The impacts of power outages on households in Puerto Rico are examined to help inform disaster mitigation and preparedness strategies.

Journal info: This article is published online, as part of a series of peer-reviewed, public health disaster research articles. No metrics are available.

- A19. Reisman, E., ~Radel, M., **Clark, S.S.,** & Buck, H. (2022). Grad school in the rear view: prioritizing career skills, mentorship, and equity in the interdisciplinary environmental PhD. *Journal of Environmental Studies and Sciences*, 1-8.

Significance: This study surveyed 132 recent participants from Interdisciplinary Environmental PhD programs across the USA. Respondents reflected on their experiences with interdisciplinarity, coursework, skills building, mentorship, equity and inclusion, teaching, and preparation for diverse career paths. We found opportunities for improving student satisfaction and career preparedness in these programs and we detail recommendations for career planning, pedagogical and skills-based training, as well as improved equity.

Journal info: Impact Factor: 2.1; JCI: 0.32; JCI Ranking: 274/334 for Environmental Sciences (Q4)

- A18. *Liu, Z., Yang, J. Z., Bloomfield, A., **Clark, S. S.**, & Shelly, M. A. (2022). Predicting recycling intention in New York state: The impact of cognitive and social factors. *Environmental Development*, 100712.
Significance: In this study, we connect the theory of planned behavior, environmental concern, recycling knowledge, and social capital to investigate recycling intention based on a representative sample of New York State residents (N = 1010). Survey results show that subjective knowledge, rather than objective knowledge, influences recycling intention through attitude, subjective norms, and perceived behavioral control. Also, environmental concern and social capital influence recycling intention through attitude and subjective norms. These findings suggest that environmental communication messaging needs to attend to contextual factors such as community connectedness.
Journal info: Impact Factor: 5.4; JCI: 0.79; JCI Ranking: 73/275 for Environmental Sciences (Q2)
- A17. **Clark, S.S.** & Miles, M. (2021). Assessing the Integration of Environmental Justice and Sustainability in Practice: A Review of the Literature. *Sustainability*, 13(20), 11238.
Significance: A literature review of studies that apply the concepts of EJ and sustainability in the US is conducted to inform ways in which the concepts are merging (or not) for practical applications. The primary objectives of this review are (1) to identify the common themes in which EJ and sustainability are applied, (2) to qualitatively assess the progression of the integration of these important movements in practical applications, and (3) to inform research gaps that exist in this area. In general, we find that despite the increasing conceptual emphasis on the need to integrate these important concepts, the reviewed scholarship reveals that in practice, the integration of EJ and sustainability remains piecemeal.
Journal info: Impact Factor: 3.9; JCI: 0.67; JCI Ranking: 149/334 for Environmental Sciences (Q2)
- A16. *Liu, Z., Yang, J. Z., **Clark, S. S.**, & Shelly, M. A. (2021). Recycling as a planned behavior: the moderating role of perceived behavioral control. *Environment, Development and Sustainability*, 1-16.
Significance: This study examines the effectiveness of a public service announcement (PSA) video designed based on the theory of planned behavior (TPB) in motivating people to engage in proper recycling. Based on a representative sample of New York State residents (N = 707), survey results show that the video increases recycling intention through attitude, but this mediated relationship is only significant among individuals with low perceived behavioral control. Theoretically, this moderated mediation effect suggests that future research based on the theory of planned behavior should not only examine the main effect of each predicting variable, but also assess the role of perceived behavior control as a moderating factor.
Journal info: Impact Factor: 4.9; CiteScore 4.4; Q1 for Geography, Planning & Development
- A15. *Yin, D., Wang, L., Zhu, Z., **Clark, S. S.**, Cao, Y., Besek, J., & Dai, N. (2021). Water quality related to Conservation Reserve Program (CRP) and cropland areas: Evidence from multi-temporal remote sensing. *International Journal of Applied Earth Observation and Geoinformation*, 96, 102272.
Significance: This study proposes an approach that combines archived survey data, water quality monitoring data (total nitrogen content, TN), and remote sensing observations to evaluate improvements in water quality by the Conservation Reserve Program (CMP), at the water-basin scale. Results indicate a significant positive correlation between CRP enrollment and the downstream water quality, however, calls for more research to expand the spatial and/or temporal scales and consider more water quality variables, to further enhance our understanding of the coupled natural and human system.
Journal info: Impact Factor: 7.5; JCI: 1.46; JCI Ranking: 5/34 for Remote Sensing (Q1)

- A14. *Moore, E.A., Russell, J.B., Babbitt, C.W., Tomaszewska, B., **Clark, S.S.** (2020). Spatial modeling of a second-use strategy for electric vehicle batteries to improve disaster resilience and circular economy. *Resources, Conservation and Recycling*, 160, 104889.
Significance: This study analyzes a circular economy management model for end-of-life lithium-ion batteries (LIBs) that could provide backup power to critical infrastructure and opportunities for post-disaster recovery using distributed energy infrastructure. The model integrates three methods: Multi-criteria decision analysis is used to determine strategic locations for second-use LIB deployment; geospatial analysis to determine efficient transportation routes from LIB consolidation points to strategic destinations; and material flow analysis to estimate anticipated local availability of second-use LIBs. A case study of Berlin, Germany, is used to demonstrate the model and show the potential contribution of integrated circular economy strategies to achieving both resilience and sustainability objectives.
Journal info: Impact Factor: 13.7; CiteScore 20.3; Ranked Q1 for Waste Management and Disposal
- A13. **Clark, S.S.**, Seager, T.P., Chester, M.V. (2018). A Capabilities Approach to the Prioritization of Critical Infrastructure. *Environment, Systems and Decisions*, 1-14.
Significance: This paper used the Capabilities Approach theory to offer an alternative view of critical infrastructure that focuses on the services that infrastructure provides rather than its physical condition or vulnerability to threats. This service-based perspective of infrastructure emphasizes its role in enabling central human capabilities that build adaptive capacity and improve human well-being. We argue that the most critical infrastructure systems are those that are essential for providing and/or supporting central human capabilities. This paper examines the evolution of the Department of Homeland Security's designation of critical infrastructure and argues for a capabilities basis for making distinctions between those systems that should be considered most critical and those that might be temporarily sacrificed. A key implication of this work is that an across-sector approach is required to reorganize existing critical infrastructure efforts around the most valuable infrastructure end-services.
Journal info: Impact Factor: 3.9 CiteScore: 6.2; Q1 for Environmental Science
- A12. Mathias, J.D., **Clark, S.S.**, Onat, N., Seager, T.P. (2018). Integrated Dynamical Modeling Perspective for Infrastructure Resilience. *Infrastructures*, 3(2), 11.
Significance: Analyzing infrastructure resilience typically involves using either resources, outcome, or process-based approaches. To offer a more integrated approach, this paper uses a dynamical model of electric power generation to show the complementary aspects of outcome, resources, and process-based approaches for analyzing infrastructure resilience. The results show that adaptation is the most influential process for outcome duration and that for monitoring to be efficient it must account for associated costs. Beyond these specific results, we suggest that nesting outcome- and process-based approaches within a dynamical controlled framework can be very useful for infrastructure managers and designers tasked with effectively allocating resources for enhancing system resilience.
Journal info: Impact Factor: 2.6; JCI: 0.53; JCI Ranking: 37/89 Construction & Building Technology; 85/179 Engineering, Civil (Q2)
- A11. Marchese, D., Reynolds, E., Bates, M. E., Morgan, H., **Clark, S. S.**, & Linkov, I. (2018). Resilience and sustainability: Similarities and differences in environmental management applications. *Science of the Total Environment*, 613, 1275-1283.
Significance: To investigate similarities, differences, and current management frameworks for increasing sustainability and resilience, a literature review was undertaken that focused on the integrated use of sustainability and resilience in an environmental management context. Three major management frameworks were identified, and implementations of these frameworks were found to have common goals

of providing benefits to people and the environment under normal and extreme operating conditions. This paper was written in collaboration with the US Army Corps of Engineers. I provided key guidance on the theory and concepts discussed in this highly cited article.

Journal info: Impact Factor: 9.8; JCI: 1.68; JCI Ranking: 20/334 for Environmental Sciences (Q1)

- A10. **Clark, S. S.**, Chester, M. V., Seager, T. P., & *Eisenberg, D. A. (2018). The vulnerability of interdependent urban infrastructure systems to climate change: could Phoenix experience a Katrina of extreme heat? *Sustainable and Resilient Infrastructure*, 1-15.

Significance: As critical infrastructure systems in the American Southwest systems age, they are increasingly vulnerable to extreme heat events that both increase infrastructure demands and reveal complex interdependencies that amplify stressors. While the traditional analytic approach to preparing for such hazards is risk analysis, the experience of Hurricane Katrina provides a warning of the limitations of risk-based approaches for confronting complexity and the potential scale and impact that can result from cascading failures under extreme stress. By contrast, this research is the first to apply resilience theory to understanding complex infrastructure interdependencies during an extreme heat event in Phoenix, AZ and the role of sensing, anticipating, adapting, and learning (SAAL) for mitigating catastrophe.

Journal info: Impact factor: 5.9; JCI: 1.35; JCI Ranking: 13/179 for Engineering, Civil

- A9. *McBurnett, L. R., *Hinrichs, M. M., Seager, T. P., & **Clark, S. S.** (2018). Simulation Gaming Can Strengthen Experiential Education in Complex Infrastructure Systems. *Simulation & Gaming*, 1046878118767729.

Significance: This article describes the experience of an educational simulation game, called the *LA Water Game*, to teach the management of aging water infrastructure as a complex socio-technical system. A total of over 200 participants in 16 workshops completed an introductory lecture, experimental scenario development, experiential gameplay, and participated in reflective group discussion. Qualitative data was collected during gameplay and debriefing interviews and was used to assess participant learning outcomes. Subjects displayed cognitive and affective engagement, intrinsic motivation, and reported an improved understanding of complex systems attributes, including interdependencies, feedback loops, nonlinearity, and stochasticity.

Journal info: Impact Factor: 2.0; JCI: 0.83; JCI Ranking: 296/759 Education & Educational Research (Q2)

- A8. **Clark, S. S.**, & Chester, M. V. (2017). A Hybrid Approach for Assessing the Multi-Scale Impacts of Urban Resource Use: Transportation in Phoenix, Arizona. *Journal of Industrial Ecology*, 21(1), 136-150.

Significance: Life cycle assessment (LCA) and urban metabolism (UM) are popular approaches for urban system environmental assessment. However, both approaches have challenges when used across spatial scales. This study explores the value of integrating UM with LCA, using vehicle transportation in the Phoenix metropolitan area as an illustrative case study. The results for Phoenix show the complexity in resource supply chains and critical infrastructure services, how impacts accrue well beyond geopolitical boundaries where activities occur, and potential system vulnerabilities.

Journal info: Impact Factor: 5.9; JCI: 0.94; JCI Ranking: 64/275 for Environmental Sciences (Q1)

- A7. **Clark, S.S.**, *Berardy, A., Hannah, M., Seager, T.P., Selinger, E. & ^Mikanda, J.V. (2015). The Role of Tacit knowledge in Facilitating Globally Distributed Virtual Teams: Lessons Learned from Using Games and Social Media in the Classroom. *Connexions*. 3(1), 113-151.

Significance: Existing literature establishes the role of tacit knowledge, or contextual knowledge gained thorough experience, in creating more effective teams that collaborate in more traditional ways. However,

there is a lack of understanding of the role tacit knowledge plays in teams collaborating digitally. In this article, we present a teaching case involving virtual collaborations between students in the U.S. and Uganda via a Twitter-based game. We observe that players who develop tacit knowledge during the game display increased interpersonal capacities. This teaching case yields important insights for developing pedagogical practices that facilitate tacit knowledge development as it relates to improving interpersonal skills for globally distributed virtual teams.

Journal info: Citescore 0.2; Q4 for Social Psychology

- A6. **Clark, S.S.**, Seager, T.P., & Selinger, E. (2015). A Development-Based Approach to Global Climate Policy. *Environment, Systems and Decisions*. 35(1), 1-10.

Significance: A common approach for addressing climate change is to reduce the cost of greenhouse gas mitigation through market-based mechanisms, which enable an economically efficient allocation of emissions. However, from a human development perspective, a market-based approach to emission allocation might not be appropriate, considering the value it places on social well-being. This research builds on previous empirical work to develop a framework for conceptualizing the relationship between carbon dioxide (CO₂) emissions and human development using the Capability Approach. The framework enables a critical examination of policy prescriptions that employ market-based methods for emission allocation due to their potential for unintended consequences for underdeveloped nations. This publication was based upon my dissertation research.

Journal info: Impact Factor: 3.9 CiteScore: 6.2; Q1 for Environmental Science

- A5. *Sadowski, J., **Spierre, S.G.**, Seager, T.P., Selinger, E., Adams, E.A., & Berardy, A. (2014). Intergroup Cooperation in Common Pool Resource Dilemmas. *Science and Engineering Ethics*, 1-19.

Significance: Fundamental problems of environmental sustainability, including climate change, require collective action on a scale that transcends the political and cultural boundaries of the nation-state. This paper reports the results of a non-cooperative game-theoretic exercise that models a tragedy of the commons problem in which groups of players may advance their positions only at the expense of other groups. Students enrolled from multiple universities and assigned to different multi-university identity groups participated in experiments that repeatedly resulted in cooperative outcomes despite intergroup conflicts and expressions of group identity. From our data and analysis, we draw out lessons that may help to inform approaches for institutional design and policy negotiations, particularly in climate change management.

Journal info: Impact Factor: 3.7; JCI: 2.66; JCI Ranking: 7/57 for Ethics (Q1)

- A4. Hannah, M. A., Berardy, A., **Spierre, S.G.** & Seager, T.P. (2013). Beyond the 'I': Framing a model of participatory ethical decision-making for international engineering communication. *Connexions* 1(2), 11-14.

Significance: This article reports on findings of an ethics education unit in a cross-institutional partnership—an American university and an Indian university—that uses noncooperative gaming theory to extend ethics education to take on a global, group/systems perspective. To address communication challenges related to fostering participatory ethical decision-making, we discuss potential avenues for pursuing participatory ethical decision-making for international contexts.

Journal info: Citescore 0.2; Q4 for Social Psychology

- A3. **Spierre, S.G.**, Seager, T.P. & Selinger, E. (2013). The 2010 Human Development Index: Implications for Climate Policy and Sustainable Development. *Sustainable Development*, 6(6).

Significance: This study investigates the diminishing returns to the United Nations Human Development Index (HDI) when compared to increasing carbon dioxide (CO₂) emissions to inform sustainable climate policy design. We find that the saturation-like trend is inherent to development indicators and not driven by the functional form of the HDI. Also, the global trend is not consistently detected when the development pathways of individual nations are examined. Nevertheless, a clear relationship between CO₂ and HDI emerges within the least developed nations, suggesting that sustainable climate policy should not allocate emission rights away from these nations. Furthermore, most developed nations exhibit periods of HDI improvement while emissions decline, reinforcing the criticality of employing broader development measures beyond indicators of income for sustainable policy design. This article stems from my dissertation research.

Journal info: Impact Factor 12.5; JCI: 2.11; JCI Ranking: 1/42 for Development Studies (Q1)

- A2. Sadowski, J., Seager, T.P., Selinger, E., **Spierre, S.G.**, & Whyte, K. (2012). An Experiential, Game-Theoretic Pedagogy for Sustainability Ethics. *Science and Engineering Ethics*, 19(3), 1323-1339.

Significance: The wicked problems that constitute sustainability require students to learn a different set of ethical skills than is ordinarily required by professional ethics. This need for a different skill set presents several pedagogical challenges to traditional programs of ethics education that emphasize abstraction and reflection at the expense of experimentation and experience. This paper describes a novel pedagogy of sustainability ethics that is based on noncooperative, game-theoretic problems. In comparison to traditional professional ethics education, the game-based pedagogy moves the learning experience from: passive to active, apathetic to emotionally invested, narratively closed to experimentally open, and from predictable to surprising.

Journal info: Impact Factor: 3.7; JCI: 2.66; JCI Ranking: 7/57 for Ethics (Q1)

- A1. Seager, T.P., Selinger, E., & **Spierre, S.G.** (2011). Determining Moral Responsibility for CO₂ Emissions: A Reply to Nolt. *Ethics, Policy & Environment*, 14(1), 39-42.

Significance: This commentary piece critiques a previously published article that estimates the climate-related deaths attributable to a typical American's activities over an average lifespan is between one and two. The critique is based upon the original article's failure to resolve the question of whether this level of emissions should be considered negligible or not. We argue that not enough context is provided to make a comparison relative to other estimates of harm, and there exists no shared moral context for understanding the significance of a statistical climate death. Also, there is no consideration for the threshold at which an individual is no longer accountable for their emissions, which are considered beyond their control since an individual's moral accountability is limited to behaviors that they can change to decrease their carbon footprint. We conclude by arguing that the individual scale is the wrong scale to address climate change and that institutional change is required.

Journal info: Impact Factor: 1.0; CiteScore 1.6; Q2 for Philosophy

Book Chapters:

- B4. **Clark, S.S.**, and Gall, Melanie. From Phoenix to Buffalo: Experiences with Extreme Temperature. In S. Cutter, C. Rubin, M. Gall (Eds.), *U.S. Emergency Management in the 21st Century: From Disaster to Catastrophe*. In Press. Taylor & Francis

Significance: I was invited to co-author this book chapter that seeks to inform challenges and barriers for emergency management in handling future disasters given external environmental and societal forces influencing both policy and practice. Our chapter focuses on lessons learned from case studies of extreme heat in Phoenix and extreme cold associated with the 2022 Buffalo blizzard.

- B3. Seager, T. P., **Clark, S. S.**, Eisenberg, D. A., Thomas, J. E., Hinrichs, M. M., Kofron, R., ... & Alderson, D. L. (2017). Redesigning resilient infrastructure research. In *Resilience and Risk* (pp. 81-119). Springer, Dordrecht.

Significance: This chapter describes barriers to policy goals related to the resilience of critical infrastructure systems and provides a catalog of theories for overcoming them.

- B2. Snell, M.L., Eisenberg, D.A., Seager, T.P. **Clark, S.S.**, Joon Oh, Y., Thomas, J.E., McBurnett, L. (2016). A Multidimensional Review of Resilience: Resources, Processes, and Outcomes. In Linkov, I and Florin, M.V. (Eds.), *International risk governance council resource guide on resilience*, 1-7.

Significance: To offer clarity on what resilience means and how to measure resilience in engineered infrastructure systems, we review resilience literature from a variety of disciplines to identify three dimensions of resilience: resources, processes, and outcome priorities. We argue that each of these three perspectives are critical in understanding a system's resilient response to an event.

- B1. Selinger E., Seager T.P., **Spierre S.G.**, & Schwartz D. (2012). Using sustainability games to elicit moral hypotheses from scientists and engineers. In P.H. Jespersen, S. Riis, & P. Almlund (Eds.), *Rethinking Climate Change Research: Clean-Technology, Culture and Communication*. Taylor and Francis. ISBN: 9781315605999

Significance: This chapter outlines a new pedagogical initiative, "An Experiential Pedagogy for Sustainability Ethics" which aspires to offer an experiential-focused approach that allows science and engineering students to grapple with the moral and ethical dimensions of sustainability challenges.

White Papers:

- C2. **Clark, S.S.**, Peterson, S., Shelly, M. Jeffers, R. (2021). Operationalizing the Capabilities Approach in the Context of Disaster Resilience: Measuring the Social Burden of Infrastructure Disruptions. DOI: 10.13140/RG.2.2.34940.05768
- C1. **Spierre, S.G. (2011)**. Rural Electrification in Uganda. *The Tiktaalik Collection: Science through Transformation*, School of Sustainability, Arizona State University Tempe AZ.
<https://keep.lib.asu.edu/items/127591>

Major Reports and Policy Documents:

- D4. *Townsend, J., **Clark, S.S.**, Renschler, C.S., ^Wilson, P.J. (2023). Erie County Climate Vulnerability Assessment. Available online via Erie County's Climate Action and Sustainability webpage for the Department of Environment and Planning. Funded through the NYS Department of Environmental Conservation.
Available:<https://www3.erie.gov/environment/sites/www3.erie.gov.environment/files/2024-03/erie-county-climate-vulnerability-assessment.pdf>
- D3. *Peterson, S.K., **Clark, S.S.**, Shelly, M.A., *Horn, S. (2022). Estimating the burden to society of attaining infrastructure services following major power disruptions: The Case Study of San Antonio, TX. Submitted to Sandia National Laboratory, as part of the Grid Modernization Lab Consortium (GMLC) Designing Resilient Communities (DRC) project, funded by the Department of Energy.

- D2. *Peterson, S.K., **Clark, S.S.**, Shelly, M.A. (2022). Estimating the burden to society of attaining infrastructure services following major power disruptions: The Case Study of El Caño Martín Peña Communities, San Juan, Puerto Rico. Submitted to Sandia National Laboratory, as part of the Grid Modernization Lab Consortium (GMLC) Designing Resilient Communities (DRC) project, funded by the Department of Energy.
- D1. **Spierre, S.G.** & Wake, C. (2010). Trends in Extreme Precipitation Events for the Northeastern United States 1948-2007. *Carbon Solutions New England*.
https://sustainableunh.unh.edu/sites/sustainableunh.unh.edu/files/media/2010_northeastextremeprecip.pdf

Conference Publications:

- E11. *Liu, Z., Yang, J. Z., **Clark, S. S.** & Shelly, A. M. (2021, August). Recycling as a planned behavior: The moderating role of perceived behavioral control. Paper presented to the virtual meeting of the Association for Education in Journalism and Mass Communication.
- E10. *Liu, Z., Yang, J. Z., Bloomfield, A., **Clark, S. S.** & Shelly, A. M. (2021, May). Predicting recycling intention in the state of New York: The impact of cognitive and social factors. Paper presented at the virtual meeting of the International Communication Association.
- E9. Baxter, J., Seager, T., & **Clark, S. S.** (2015). Gamiformics: A Systems-Based Framework for Moral Learning through Games. *Proceedings of the International Symposium on Sustainable Systems & Technologies*. Dearborn, Michigan, May 18-20.
- E8. **Clark, S. S.**, Seager, T. P., Chester, M., *Eisenberg, D. A., Sweet, D., & Linkov, I. (2014, December). Resilience Simulation for Water, Power & Road Networks. In *AGU Fall Meeting Abstracts*.
- E7. Antaya, C.L., Adams E.A., **Clark, S.S.**, Seager, T.P. & Landis, A. (2014). Using Conation to Enhance Student Satisfaction with Teams in SOS110. *National Technical Association*, Atlanta, GA, September 24-26.
- E6. **Spierre, S.G.**, Seager, T.P., Selinger, E. (2013). A Development- Based Approach to Global Climate Policy. *Proceedings of the International Symposium on Sustainable Systems & Technologies*. Cincinnati, OH, May 15-17.
- E5. **Spierre, S.G.**, Martin, E.A., Sadowski, J., Berardy, A., McClintock, S., Augustin, S., Hohman, N., & Banna, J. (2012). An Experiential Pedagogy for Sustainability Ethics. *Proceedings of the American Society of Engineering Education*. San Antonio TX, June 10-13
- E4. **Spierre, S.G.**, Seager, T.P. & Selinger, E. (2011). Using the Capability Approach to Address Climate Change and Human Development. *Proceedings of the 2011 Human Development and Capabilities Association*. Den Hague, Netherlands, September 6-8.
- E3. **Spierre, S.G.**, Seager, T.P., Selinger, E., & Sadowski, J. (2011). Using Non-cooperative Games to Simulate Ethical Tensions in Climate Policy Negotiations. *Proceedings of the 2011 IEEE International Symposium on Sustainable Systems and Technology*, Chicago, IL
- E2. **Spierre, S.G.**, Seager, T.P. & Selinger, E. (2010). Determining an Equitable Allocation of Global Carbon Dioxide Emissions. *Proceedings of the 2010 IEEE International Symposium on Sustainable Systems and Technology*. Arlington, VA

- E1. Seager, T.P., Selinger, E., Whiddon, D., Schwartz, D., **Spierre, S.G.**, & Berardy, A. (2010). Debunking the fallacy of the individual decision-maker: An experiential pedagogy of sustainability ethics. *Proceedings of the 2010 IEEE International Symposium on Sustainable Systems and Technology*. Arlington, VA

Scholarly Articles:

- F5. **Clark, S. S.**, & Seager, T. P. (2017). A Human-Centered Approach to the Prioritization of Critical Infrastructure Resilience. *The CIP Report*. Center for Infrastructure Protection & Homeland Security, George Mason University. <https://cip.gmu.edu/2017/07/13/human-centered-approach-prioritization-critical-infrastructure-resilience/>
- F3. **Clark, S.S.** & Seager, T.P. (2015) A Socio-Technical Approach to Critical Infrastructure Resilience. *The CIP Report*. Center for Infrastructure Protection & Homeland Security, George Mason University. <https://cip.gmu.edu/2015/11/23/a-socio-techniure-resilience/>

Manuscripts and Book Chapters in Development:

- G4. Peterson, S. and **Clark, S.S.** A Human-Centered Approach for the Prioritization of Critical Infrastructure for Communities: Empirical Evidence from Power Outages in Puerto Rico. Submitting to *Local Environment*

Significance: This article builds upon my theoretical publications that use the Capabilities Approach to inform the prioritization of critical infrastructure. It uses household survey data related to the social impacts of power outages in Puerto Rico to empirically test and validate the prioritization of critical infrastructure services from a human-welling being and community-based perspective.

- G3. **Clark, S.S.**, Tangirala, A., and Shelly, M.A. A Data-Driven Approach to Understanding Household Burdens During Winter Storm Uri. Submitting to *Nature Sustainability*

Significance: This article reports the results of using machine learning and data science techniques on household survey data collected after Winter Storm Uri to reveal the household characteristics of the most socially burdened households and explores how well popular social vulnerability factors and household characteristics may predict experienced social burden.

- G2. **Clark, S.S.** Seasonality of Social Burden: Evidence from Power Outages in Puerto Rico and Texas. Submitting to *Energy Research and Social Science*

Significance: This manuscript uses household survey data following power outages in Puerto Rico and Texas to understand how the social burden of infrastructure disruption events differs according to season and climatic factors.

CREATIVE & APPLIED RESEARCH PRODUCTS

- H10. Seager, T.P. & **Clark, S.S.** (2016). Pokémon Go Help Someone: How augmented reality games could connect people after disasters. Future Tense, Slate Magazine. <https://slate.com/technology/2016/11/using-pokemon-go-to-help-with-disaster-recovery.html>
- H9. McBurnett, L.R., Hinrichs, M.M., **Clark, S.S.**, Seager, T.P. (2015). “La Water Game”: Co-developed a serious game for simulating urban water management decisions. We created a simple systems dynamics model to represent the problem of maintaining the quality of the Los Angeles water distribution infrastructure over a 75-year period. Although the technical model is not specific to Los Angeles, the

frequency of water main breaks during the severe California drought of 2014 allowed the game facilitators to draw upon popular news articles and events to make gameplay emotionally more salient for players.

- H8. **Spierre, S. G.**, Sadowski, J., Berardy, A., McClintock, S., Augustin, S-A., Hohman, N., & Banna, J. (2012) An Instructor's Guide to Teaching the Pisces Game for Sustainability Ethics. *The Tiktaalik Collection: Science through Transformation*. School of Sustainable Engineering & The Built Environment, Arizona State University: Tempe AZ. <https://keep.lib.asu.edu/items/127597>
- H7. Seager, T.P., **Spierre, S.G.**, & Selinger, E. (2012). “Pisces Game”: Co-developed an educational, non-cooperative game that simulates the problem of the Tragedy of the Commons. Participants are put into groups according to their zodiac sign, representing fisherman villages that share a common lake to survive. Villages take turns harvesting enough fish from the lake in each round to survive. Teams at the end of the harvest order (the Pisces Team) are at a disadvantage and may suffer from a lack of resources. This fosters discussions of fairness and responsible decision-making among participants.
- H6. **Spierre, S.G.**, Seager, T.P., Selinger, E., Sadowski, J. (2012). *Using Non-cooperative Games to Simulate Ethical Tensions in Climate Policy Negotiations*. Science Education Resource Center at Carleton College. <https://shorturl.at/tyW24>
- H5. **Spierre, S.G.**, Seager, T.P. (2012). The Externalities Game (TEG) Guide for Instructors. Science Education Resource Center at Carleton College. <https://rb.gy/ak1zme>
- H4. **Spierre, S.G.** (2012). *Introduction to Game Theory, Collective Action, and Climate Change*. Science Education Resource Center at Carleton College. <https://cleanet.org/details/files/33055.html>
- H3. Seager, T.P., **Spierre, S.G.**, & Selinger, E. (2012). “The Externalities Game”. Co-developed a noncooperative, educational game designed to teach participants about environmental externalities and the challenges to collective action, especially related to international climate change mitigation. <https://serc.carleton.edu/introgeo/games/examples/62222.html>
- H2. **Spierre, S.G.**, Seager, T.P. & Selinger E. (2012). Negative Externalities and the Coase Theorem. *Sustainability Ethics: Experiential Approaches to Moral Complexity*. <https://sustainabilityethics.com/2014/10/01/negative-externalities-and-the-coase-theorem/>
- H1. **Spierre, S.G.**, Seager, T.P., Selinger, E., & Sadowski, J. (2012). An Experiential Pedagogy for Sustainability Ethics: The Externalities Game. *Starting Point: Teaching Entry Level Geoscience*. <https://serc.carleton.edu/introgeo/games/examples/62222.html>

RESEARCH FUNDING

Grants Pending:

- I5. *SCC-CIVIC-PG Track A: Co-designing a Climate-Resilience Toolkit: Identifying Gaps and Needs in Building-Improvement Resources for Vulnerable Households and Communities*. To be submitted to the National Science Foundation by May 1st 2024. Lead by Laura Arpan, Communication. **Co-PI**. (\$75,000)
- I4. *Neighborhood Resilience Plan for Buffalo, NY*. Submitted to the Environmental Protection Agency’s Environmental and Climate Justice Community Change Grants Program. UB would be a sub-award, led by PUSH Buffalo. **PI**. (\$400,000)

- I3. *Support for Buffalo Niagara Waterkeeper's Coastal Resilience Initiative*. Lead by Bart Roberts at UB Regional Institute. Submitted to Buffalo Niagara Waterkeeper. The Prime Sponsor is NOAA. **Co-PI**. (\$776,413).
- I2. *HNDS-R: Examining the impacts of the 2022 Buffalo blizzard and spatial disparities in community resilience: disrupted human mobility, help requests, and voluntary support*. Lead by Yingjie Hu, Geography. Submitted to National Science Foundation. **Co-PI**. (\$742,711).
- I1. *Field Initiated Research Proposal*. Lead by Jordana Maisel, Urban & Regional Planning. Submitted to Administration for Community Living. **Co-PI**. (\$600,000).

Grants Awarded:

- J26. *Toolset and Training Development for Exploratory Future Scenario Planning and Simulation for Climate Change Adaptation*. **Co-PI**. Funded by New York State Department of Environmental Conservation, Office of Climate Change. (\$650,000). MOU with DEC is being finalized now. 2024-2027

Significance: I am the Co-PI of this project that will be developing a framework for climate adaptation scenario planning that integrates visualizations and participatory simulations using serious games. The developed framework and toolset will be used by the NYSDEC Office of Climate Change as a training tool for community-based resilience planning occurring across New York State.
- J25. *Toward a Climate Haven: Preparing for Climate Change in the Great Lakes Region by Combining Performance and Science*. **Co-PI**. Funded internally as part of the Seed Projects in Arts and Sciences Research and Creative Activities (SPARC) program in the College of Arts and Sciences (\$30,000). 2024

Significance: I am Co-PI on an internally funded project blending sustainability science with performance art to address Western New York's role as a potential climate refuge amid its climate uncertainties. It aims to foster public engagement and planning through activities, theatrical works, a conference, and publications, focusing on creating a socially just and ecologically sustainable community in Buffalo, a projected "climate haven" for climate migrants.
- J24. *SAI Integrating equity in emergency management: A human-centered decision framework to improve polycentric governance of critical infrastructure in wildland-urban interfaces*. **Co-PI**. Funded by the National Science Foundation's Saving America's Infrastructure Program, Award# 2324616. (\$750,000). 2023-2026.

Significance: I am Co-PI on this NSF-funded project, focused on integrating the disproportionate impacts of wildfire-induced critical infrastructure failures on socially vulnerable communities across the Western USA. I am leading the community engagement and social science research on this project, including the design, implementation, and analysis of a household survey and numerous community focus groups.
- J23. *Heat Emergency Planning for Erie County, NY*. 2022. **PI**. Funded by the New York State Department of Environmental Conservation, Climate Smart Communities Program through Erie County Department of Environment & Planning. (\$100,000). 2024-2026

Significance: I am the PI of the UB sub-award for this NYSDEC and Erie County planning project to develop a locally informed heat emergency plan for Erie County in collaboration with key community stakeholders. This is a key objective of the recently developed Community

Climate Action Plan for Erie County to become more climate resilient, as extreme heat situations are expected to become more frequent and severe as our planet warms.

- J22. *Planning for Solar Investment at the Convergence of Resilience and Equity*. **PI**. Funded by the US Department of Energy's Renewables Advancing Community Energy Resilience (RACER) Funding Program. Sub-award to UB through the National Renewable Energy Laboratory. (\$59,734). Team includes University of Washington, Electric Power Research Institute, Seattle City Light, Seattle Mayor's Office of Sustainability and Environment. 2023-2025

Significance: I am the PI of the UB sub-award for this US DOE and National Renewable Energy Lab project to develop a neighborhood-scale quantification and valuation tool to determine the social benefits of renewable-based resilience investments in disadvantaged communities. This project involves stakeholder engagement activities across several communities in South Seattle to inform energy resilience investments that support community needs and preferences.

- J21. *Imagining Erie County's Future*. Funded internally as part of the Civic Engagement Research Fund Opportunity. I am sharing the **PI** role of this grant with my Postdoc Kacey Stewart (\$5,000). 2023-2024

Significance: This internally funded project is engaging local high school students in climate change scenario planning through a speculative fiction writing workshop. It seeks to gather and share the voices of local youth about our region's future with the Erie County Department of Environmental Planning to integrate the perspectives of youth into actual climate change planning and policy discussions.

- J20. *Extreme Heat Action Plan Expert Review Panel*. **Co-PI**. Funded by New York State Department of Environmental Conservation, Office of Climate Change. (\$120,553). 2023

Significance: I was a Co-PI for this project that supported the development of New York State's extreme heat adaptation plan (EHAP). We convened an interdisciplinary expert panel on extreme heat research, developed a literature review of extreme heat impacts, risks, vulnerabilities and adaptation practices, as well as organized monthly webinar presentations related to climate adaptation and extreme heat to increase literacy and competency of state staff working to develop the EHAP.

- J19. *Assessing the Well-being and Health Impacts of Infrastructure Disruptions for Communities in Puerto Rico*. **PI**. Funded by the Natural Hazards Center, Strengthening Community Resilience in U.S. Territories. (\$50,000). 2022

Significance: I was the PI of this project that advanced the Capabilities Approach theory to investigate the human toll of disaster events as well as build community resilience. The project focused on understanding and quantifying the well-being impacts of power outages on households across Puerto Rico. This included collecting a representative sample island-wide survey of Puerto Rican households to identify the type and intensity of capability losses experienced across different types of households, specifically focusing on the differences in burden as reported by households in both rural and urban locations.

- J18. *NSF Conference Proposal: Student and Junior Faculty Support for the International Symposium on Sustainable Systems and Technology (ISSST)*, Award# 2132324. **PI**. (\$7500). 2021

Significance: I was PI on this conference proposal that was awarded to help fund a diverse pool of students and early career faculty's participation in the conference.

- J17. NSF RAPID: *Operationalizing the Capabilities Approach in the Context of Disaster Resilience: Measuring the Social Burden of Infrastructure*, Award# 2128030. **PI**. (\$199,434). 2021-2022 (extended to 2023)
- Significance: I was PI of this NSF-funded project that assessed the impacts of power outages and associated infrastructure disruptions (e.g., water and transportation) on Texan households following Winter Storm Uri in 2021. Using a representative, outage-wide survey we identified the type and intensity of capability losses experienced by different types of households and examined the role of prior outage experience in mediating impacts.
- J16. *Building Local Partnerships and Shared Data to Support Community Resilience: The CIVIC Innovation Challenge to COVID-19*. **PI**. Funded by SUNY COVID Seed grant. (\$7500). 2021
- Significance: This seed grant provided resources to gather preliminary data and develop a larger proposal to the National Science Foundation to study community resilience locally in Buffalo, NY.
- J15. *Using Human Behavioral Science and Outreach/ Education Initiatives to Decrease Contamination and Improve Recycling in New York State*. **Co-PI**. NYS Department of Environmental Conservation. (\$768,865). 2019-2021
- Significance: I was Co-PI on this project that focused on using human behavioral science and outreach/education initiatives to decrease contamination and improve recycling in New York State. This included a survey of New York State residents to assess their knowledge, attitudes, and behavioral intentions toward recycling to inform an intervention strategy/ informational campaign to improve recycling rates and reduce contamination within recycling.
- J14. *OUTSTEP Lower Great Lakes: Organizing Urban Transects for a Sustainable Transformation of Economic Partnerships across the Lower Great Lakes*, Award# 1929917. **Co-PI**. National Science Foundation Conference Proposal. (\$50,000). 2019
- Significance: This proposal funded a conference in Buffalo, NY. The objective of organizing and hosting this three-day conference was to provide a scientific foundation for a sustainability strategy on urban systems for the Lower Great Lakes region by bringing together sustainability and resilience scholars from across academic disciplines and stakeholders. The conference initiated a region-wide research and community engagement effort, that formed an ongoing regional network of scholars working toward sustainability in the region.
- J13. *Climate Vulnerability Assessment for Erie County, NY*. **PI**. Funded by the New York State Department of Environmental Conservation (NYS DEC), Climate Smart Communities Program. (\$99,476). 2019-2020
- Significance: I was PI on this project funded by the NYS DEC through Erie County, Department of Environment and Planning. In collaboration with my colleague in Geography and several students, the UB team conducted a vulnerability assessment using the exposure, sensitivity, and adaptive capacity approach to determine overall vulnerability to flooding, extreme heat, and biological threats (vector borne-disease). The project assessed impacts of these hazards on critical facilities and infrastructure, vulnerable populations, and natural resources as they pertain to sectors and planning areas that are under Erie County jurisdiction. See <https://shorturl.at/aduXS>
- J12. *Estimating the burden to society of attaining infrastructure services following major power disruptions*. **PI**. Funded by the Department of Energy, partnering with Sandia National Laboratory. (\$287,148). 2018-2021

- J11. *Developing thermal extreme indicators for vulnerability assessment & climate adaption. Co-PI.* Seed Project funded by the RENEW Institute, UB. (\$35,000). 2018
- J10. *Integrated Modeling of Climate Change and Human Influence on Land Use and Hydrology with Remote Sensing. Co-PI.* Seed Project funded by the RENEW Institute, UB. (\$35,000). 2018
- J9. *Veteran Engagement in the NEPTUNE Program: Resilience Processes in Positive Case Studies. Co-PI.* Funded by the Office of Navel Research and ASU Lightworks. (\$1,500,000). 2015
Significance: My contribution to this project was mentoring student veterans to examine positive examples or case studies of avoided infrastructure disruptions that offer lessons learned to avoid catastrophe in future systems. The students investigated the characteristics of these resilient systems, including organizational communication and other human dimensions of infrastructure management.
- J8. *Collaborative Research: RIPS Type 2: Resilience Simulation for Water, Power & Road Network. Research Scientist.* Funded by the National Science Foundation, Resilient Interdependent Infrastructure Processes and Systems (RIPS), Award# 1441188. (\$2,500,000). 2014-2017
Significance: My contribution to this award was working on constructing a simulation experience that investigated how different experts, stakeholders, individuals, and groups act in simulated decision scenarios related to managing interdependent infrastructure systems.
- J7. *Advancing Infrastructure and Institutional Resilience to Climate Change for Coupled Water-Energy Systems. Research Scientist* (wrote aspects of the proposal). Funded by the National Science Foundation, Water, Sustainability and Climate (WSC). (\$600,000). 2014-2016
Significance: As a postdoctoral scholar at ASU, I aided in writing the social science sections of this proposal, which focused on conducting an institutional analysis of the organizations that own, operate, and manage the coupled water and energy systems in Phoenix, Arizona. I conducted semi-structural interviews with dozens of local infrastructure stakeholders to better understand and map the institutional overlaps of these critical systems. The objective was to understand how the governance of water and electricity services can be coordinated to proactively reduce future vulnerability.
- J6. *Sustainable New Product Development. Co-PI.* Funded by the Ray C. Anderson Foundation. (\$60,000). 2014
Significance: This award resulted in the creation of a collaborative student capstone class at ASU that integrated sustainability into the engineering design process. I helped design the sustainability aspects of this course and ran a few experiential learning activities in the classroom focused on sustainability learning outcomes.
- J5. *International Game-Play for Climate-Policy Research. PI.* Funded by the Arizona Board of Regents. (\$5,000). 2013
- J4. *Social & Technical, Barriers & Burdens to Terawatt scale Photovoltaic Technology. Co-PI.* Funded by the ASU Graduate Interdisciplinary Studies Education and Research (GISER). (\$500). 2013
- J3. *Integrating Sustainability Grand Challenges via Experiential Learning Labs. Co-PI.* Funded by the ASU Graduate Interdisciplinary Studies Education and Research (GISER). (\$500). 2012
- J2. *Transforming Teamwork through Conative Awareness. Co-PI.* Funded by the ASU Graduate Interdisciplinary Studies Education and Research (GISER). (\$500). 2012

- J1. *An Experiential Pedagogy for Sustainability Ethics*. **Graduate Research Assistant**. Funded by the National Science Foundation Division of Engineering Education and Centers, Award#1134943 (\$400,000). 2009-2013.

Significance: This award funded my graduate studies at Arizona State, resulting in a portfolio of outcomes including the creation of experiential learning games, and instructional materials, as well as a portfolio of scholarly publications.

Select Declined Proposals:

- K8. REU Site: Building Community College Leaders in Climate Change and Environmental Justice. **Co-PI**. (\$467,465) Submitted to the National Science Foundation. Lead by Christopher Lowry. 2022
- K7. Focused Hub: The PEOPLES Research Hub – Identifying Pathways and Strengthening Relationships for Equitable, Sustainable, and Resilient Coastline Communities. Submitted to the National Science Foundation. **Co-PI**. (\$4,995,296). Lead by Christian Renschler. 2022
- K6. NSF SRS RN: OUTSTEPS Lower Great Lakes: Convergent Research in Just Sustainability and Resilience across Urban and Rural Systems. Co-PI. (\$15,000,000) Collaborative Proposal with Clarkson, SUNY Oswego, SUNY ESF, Penn State, University of Toledo, University of Michigan, and Seneca Nation. We were a finalist but ultimately did not get awarded. 2021
- K5. NSF-Focused CoPI: PEOPLES living on the edge – A theory of change along the Great Lakes coastline. **Co-PI**. (\$5,000,000). Lead by Christian Renschler. 2022
- K4. CNH2-L: Informing Agri-Environmental Policy Design through the development of an Integrated System of Policy Perceptions, Land Use, and Water quality. **Co-PI**. National Science Foundation. (\$1,600,000). 2019
- K3. Self-Sustainable Energy Cloud for Situational Awareness in Resilient Solar Energy Microgrids. **Co-PI**. Department of Energy EERE. Lead by Shenqiang Ren (\$4,500,000). 2021
- K2. Collaborative Research: A System Dynamics Approach to Critical Infrastructure Resilience: Prioritizing Infrastructure Services to Support Human Needs. Submitted to NSF Infrastructure Management and Extreme Events. **PI**. (\$600,000). 2016
- K1. Critical Infrastructure Resilience Center of Excellence Partner Proposal (Northeastern was Center Lead). **Co-PI**. Submitted to Department of Homeland Security. (\$20,000,000). 2015

CONFERENCE PRESENTATIONS

Legend: *Graduate student; ~Undergraduate student; ^Community or government

- L26. **Clark, S.S.**, Mukerjee, S., Walteros, J., Yeo J., *Roy, P. (2024, July). Social Burden of Wildfire-Induced Critical Infrastructure Service Disruptions on Disadvantaged Communities: The Case of Wildfire in the Western U.S.. 49th Annual Natural Hazards Research and Applications Workshop, Boulder, CO
- L25. **Clark, S.S.**, Reisman, E., Buck, H., ~Radel, M. (2022, June). Grad School in the Rear View: Prioritizing Career Skills, Mentorship, and Equity in the Interdisciplinary Environmental PhD. Presented at the 29th International Symposium on Sustainable Systems and Technology (ISSST), Pittsburgh, PA
- L24. **Clark, S.S.**, *Peterson, S.K., Rivera-Gutiérrez, R., *Zambrana-Rosario, A.C., Shelly, M.A. (2022, June). Measuring the Social Burden of Infrastructure Disruptions to Inform Resilience Planning:

Recent Power Outages in Puerto Rico. Presented at the 29th *International Symposium on Sustainable Systems and Technology (ISSST)*, Pittsburgh

- L23. **Clark, S.S.** “Inequities of Climate Change Impacts”, Presented at People on the Move in a Changing Climate Great Lakes Workshop, June 1-3, 2022, Buffalo, NY
- L22. *Zambrana-Rosario, A.C., **Clark, S.S.**, *Peterson, S.K., Rivera-Gutiérrez, R., Shelly, M.A. “Impact of Infrastructure Disruptions On Puerto Rican Household Capabilities, Health, And Well-Being”, 2022 *American Public Health Association Annual Meetings*, November 6-9, Boston, MA
- L21. *Liu, Z., Yang, J. Z., **Clark, S. S.** & Shelly, A. M. (2021, August). Recycling as a planned behavior: The moderating role of perceived behavioral control. Paper presented to the virtual meeting of the *Association for Education in Journalism and Mass Communication*.
- L20. *Peterson, S.K., **Clark, S.S.**, Jeffers, R., Shelly, M.A. “A Capabilities Framework for Understanding the Community Burden of Power Loss”, 2020 *Virtual International Symposium on Sustainable Systems & Technology (ISSST)*
- L19. *Liu, Z., Yang, J. Z., Bloomfield, A., **Clark, S. S.** & Shelly, A. M. “Predicting recycling intention in the state of New York: The impact of cognitive and social factors”, Presented at the 71st Annual ICA Conference, Engaging the Essential Work of Care: Communication, Connectedness, and Social Justice 27-31 May 2021.
- L18. **Clark, S.S.**, Shelly, A.M., *Peterson, S.K.E. “Estimating the social burden of attaining critical services following major power disruptions” Presented at the 2019 *International Symposium of Sustainable Systems and Technology*, June 25-27, Portland, OR
- L17. **Clark, S.S.** “A Human Centered Approach to the Prioritization of Critical Infrastructure Resilience. Presented at the 2017 *International Resilience Colloquium: Urban Resilience: Research Gaps and Implementation Roadmap* at the University of New Mexico Resilience Institute, August 7-8, Albuquerque, NM
- L16. **Clark, S.S.** “A Capabilities Approach towards Prioritization of Critical Infrastructure Resilience”, 2017 *Frontiers in Resilience: Developing Innovative Resilience Solutions at the Interface of Science, Economics, and Policy*, May 10-11, Arlington, VA.
- L15. **Clark, S.S.** & Chester, M.A. “The Vulnerability of Interdependent Urban Infrastructure Systems to Climate Change: Could Phoenix Experience a Katrina of Extreme Heat?”, 3rd *National Symposium on Resilient Critical Infrastructure*, August 16-18, 2016, Chicago, IL
- L14. **Clark, S.S.** “A Capabilities Approach to Critical Infrastructure Resilience”, 2016 *International Symposium of Sustainable Systems and Technology*, May 16-18, Phoenix, AZ
- L13. **Clark, S.S.** “A Capabilities Approach to Critical Infrastructure Resilience”, ASCE and The Infrastructure Security Partnership’s 2016 Critical Infrastructure Symposium, April 3-5, Charleston, SC.
- L12. **Clark, S.S.** “A Capabilities Approach to Resilience”, 2nd National Symposium on Resilient Critical Infrastructure, August 18-20, 2015, Philadelphia, PA
- L11. **Clark, S.S.** “Socio-Technical Resilience of Critical Infrastructure”, 2015 Integrated Network for Social Sustainability Annual Conference, April 8-10, Tempe AZ

- L10. **Clark, S.S.**, & Chester, M.A. “Institutional Resilience of Coupled Water and Energy Systems to Climate Change in Phoenix, Arizona”, 2015 *International Symposium of Sustainable Systems and Technology*, May 18-20, Dearborn, MI
- L9. **Clark, S.S.**, & Chester, M.A. “A Multi-Scale Analysis of Phoenix Highway Transportation”, 2014 *International Symposium of Sustainable Systems and Technology*, May 19-21, 2014, San Francisco, CA
- L8. **Clark, S.S.** “Social Capital: The Key to Sustainable Development & Resilient Communities”, 2015 Transformation Conflict Summit, April 24, Panelist for the Communication for Sustainability, Happiness, and Neighborhood Development Session, Tempe, AZ
- L7. **Spierre, S.G.**, Seager, T.P. “An Experiential Pedagogy of Sustainability Ethics”, 2014 *Society of Environmental Toxicology and Chemistry*, May 12-16, 2014, Basel, Switzerland
- L6. **Spierre, S.G.**, Seager, T.P. “An Experiential Pedagogy of Sustainability Ethics”, 2013 *International Symposium of Sustainable Systems and Technology*, May 15-17, 2013, Cincinnati, OH
- L5. **Spierre, S.G.**, Seager, T.P. “Understanding the 2010 Human Development Index Calculation”, 2012 *IEEE International Symposium on Sustainable Systems and Technology (ISSST)*, poster presentation, May 16-18, 2012, Boston, MA.
- L4. **Spierre, S.G.** & Seager, T.P. “Determining an Equitable Approach to Global Climate Change Policy”, 2012 *International Conference on Climate Adaptation*, May 29-31, 2012, Tucson, AZ
- L3. **Spierre, S.G.**, Seager, T.P. “Using the Capability Approach to Address Climate Change and Human Development”, 2011 *Human Development and Capabilities Association (HDCA) Conference*, September 6-8, 2011, Den Hague, Netherlands
- L2. **Spierre, S.G.**, Seager, T.P. “Determining an Equitable Allocation of Global Carbon Dioxide Emissions”, 2010 *IEEE International Symposium on Sustainable Systems and Technology (ISSST)*, May 17-19, 2010, Arlington, VA
- L1. **Spierre, S.G.**, Wake, C. “Changing Trends in the Frequency and Variability of Extreme Precipitation Events in New England”, *American Geophysical Union: The Meeting of the Americas 2008 Joint Assembly*, poster presentation, May 27-30, 2008, Ft. Lauderdale, FL

INVITED TALKS & GUEST LECTURES

Invited Talks:

- M23. 2024, April 12. “Contemplating the Social Burden of Wildfires’ Webinar and Panel Discussion, hosted by the University at Buffalo, Wildfire Emergency Management Webinar Series.
- M22. 2023, January 23. ‘Climate Adaptation Planning’. Presented at the Extreme Heat Action Plan Forum Meeting and Webinar, hosted by New York State Department of Environmental Conservation Office of Climate Change
- M21. 2023, 19 January. “Measuring the Social Burden of Infrastructure Disruptions to Inform Resilience Planning”. Presented as part of Climate Focus Area Lightning Talks session, RENEW

- M20. 2022, August 4. “Impact of Infrastructure Disruptions on Puerto Rican Household Capabilities, Health, and Well-Being” Presented at the Strengthening Community Resilience in U.S. Territories Public Webinar.
- M19. 2021, 3 August “Creating a Culture of Sustainability” Webinar presentation hosted by the Buffalo & Erie County Public Library.
- M18. 2021, 27 April. “Estimating the social burden of attaining critical services following major power disruptions”. Presented to GMLC Designing Resilient Communities Stakeholder Advisory Group Annual Meeting with Sara Peterson (grad student)
- M17. 2019, 19 November. Panelist for “Exploring Policy and Regulatory Frameworks for University Resilience Work that Both Serves Immediate Needs and Creates Models for Change”, RISE 2019, Albany, NY
- M16. 2020, 18 November. Panelist for 'Erie County Climate Vulnerability Assessment' part of UB Geography Awareness Week - GIS Day 2020
- M15. 2020, 24 October. Panelist for ‘Higher Education Institutions: Partners in Social & Economic Community Resilience’ webinar, hosted by the Association for the Advancement of Sustainability in Higher Education. <https://shorturl.at/iwCY9>
- M14. 2020, 18 September. Panelist for 'Building A Regional Network of Universities across Borders under COVID -19' part of the University Global Coalition 2020 Virtual Gathering
- M13. 2019, 1 November. “A model for tying critical infrastructure to community services and values”, Resilient Investment, Planning and Development Working Group, Arlington, VA.
- M12. 2017, 9 August. “A Service-based Approach to the Prioritization of Critical Infrastructure Resilience” Sandia National Laboratories, Albuquerque, NM
- M11. 2016, 18 April. “An Interdisciplinary Approach to Critical Infrastructure Resilience” College of Natural Resources, North Carolina State University, Raleigh, NC
- M10. 2016, 24 February. “An Interdisciplinary Approach to Critical Infrastructure Resilience” Earth & Environment, Boston University, Boston, MA
- M9. 2016, 28 January. “An Interdisciplinary Approach to Critical Infrastructure Resilience” Earth and Environmental Studies, Montclair State University, Montclair, NJ
- M8. 2015, 22 July. “Climate Change and Resilience” Grand Challenges Scholars Program, Arizona State University, Tempe AZ
- M7. 2017, 1 June. “Climate Change, Sustainability, and Resilience”, Aruba Summer School invited talk at the University of Aruba
- M6. 2015, 8 April. “Climate Change, Games, and Resilience: A Sampling of Research by an Interdisciplinary Scholar”, Consortium for Science, Policy & Outcomes, Tempe, AZ
- M5. 2015, 10 March. “Infrastructure Resilience: Bringing the Social & Technical Together” Walton Sustainability Solutions Initiatives, at Arizona State University

- M4. 2015, 30 March. “Socio-Technical Resilience of Critical Infrastructure” Center for Behavior, Institutions, and the Environment. Arizona State University, Tempe, AZ
- M3. 2011, 21 November. “Experiential Pedagogy for Sustainability Ethics.” GK-12 Fellows Seminar, Arizona State University, Tempe, AZ
- M2. 2011, 26 & 29 October. “Climate Change and Human Development.” Development Studies class guest lecture, Makerere University, Kampala, Uganda
- M1. 2011, 22 March. “An Experiential Pedagogy of Sustainability Ethics” Environmental Engineering Seminar, Arizona State University, Tempe, AZ

Guest Lectures:

- N11. 2024, 29 February. “Energy and Community Resilience”, guest lecture for Energy and Society (EVS 385), University at Buffalo, Buffalo, NY
- N10. 2023, 3 April. “Climate Change and Human Health Impacts”, guest lecture for Environmental Health (PUB350), University at Buffalo, Buffalo, NY
- N9. 2021, 23 March. “Community Resilience”, *Engineering Management Program*, UC Boulder, March 23rd, 2021
- N8. 2019, 12 September. “Erie County Climate Vulnerability Assessment” *Integrated Environmental Management*, University at Buffalo, Buffalo, NY
- N7. 2018, 1 November. “A development-based approach to global climate policy” *Climate Change Policy*, University at Buffalo, Buffalo, NY
- N6. 2018, 21 June. “Community Resilience”, *Puerto Rico Recovery Assistance Clinic*, University at Buffalo, Buffalo, NY
- N5. 2016, 26 October. “A Capabilities Approach to Critical Infrastructure Resilience” *Resilient Infrastructure*, Arizona State University, Tempe, AZ
- N4. 2013, 4 April. “Walking Audit of Waste Management Practices on ASU Campus” *Sustainability Science for Teachers*, Arizona State University, Tempe, AZ
- N3. 2012, 19 September. “Cooperation for Climate.” *Sustainability Ethics*, Arizona State University, Tempe, AZ
- N2. 2011, 30 August. “Using the Capability Approach to Address Climate Change and Human Development.” *Sustainability Ethics*, Arizona State University, Tempe, AZ
- N1. 2011, 15 March. “Cooperation for Climate” *Sustainability Ethics*, March 15, 2011, Rochester Institute of Technology, Rochester, NY

WORKSHOPS

Invited Participant:

- O7. 2023, November 2-3. Michigan Sea Grant Coastal Resilience Workshop (funded by Michigan Sea Grant). Ann Arbor, Michigan

- O6. 2023, April 20-23. “The Climate Governance Variability in the Great Lakes Annual Meeting” (sponsored by NSF RCN). Duluth, Minnesota
- O5. 2022, June 1-3. “People on the Move in a Changing Climate Great Lakes Workshop” (sponsored by NSF Coastlines and People RCN, hosted by NY Sea Grant.
- O4. 2020, October 19-20. “Advancing the Theory and Practice of Urban Heat Resilience” hosted by Aspen Global Change Institute
- O3. 2015, April. Leadership Program “Teaching Through Research”
Selected to participate in a weeklong workshop on innovative educational approaches at the Center for Interdisciplinary Research in Paris, France
- O2. 2013, April. Social and Technical Issues of PV Technology Workshop
A student-organized workshop devoted to bringing together both engineers and social scientists to discuss the social and technical barriers and burdens of photovoltaic technology.
- O1. 2012, April. Sustainable Development Workshop, Columbia University, NY
Two-day Interdisciplinary Ph.D. Workshop in Sustainable Development

Organized or co-organized:

- P11. 2019. Renschler, C., Park, J., Clark, S.S., Shelly, M., McPherson, R. “A Conference Organizing Urban Transects for a Sustainable Transformation of Economic Partnerships across the Lower Great Lakes (OUTSTEP-LGL)”. <https://www.outsteps.org/event-details/2019-outstep-inaugural-workshop>
- P10. 2019. Clark, S.S. & Peterson, S. “Community Leadership Focus Group” Corporación ENLACE del Caño Martin Peña, Puerto, Rico. Focus Group tested a questionnaire among community leaders seeking information about the impact of power outages on critical services.
- P9. 2019. Clark, S.S. “The Food Energy Water Nexus: A Systems Approach for Improving Energy Conservation”. Educational seminar and networking event hosted by the Western, NY Sustainable Business Roundtable. <https://www.wnysustainablebusiness.org/events/the-food-energy-water-nexus>
- P8. 2018. Clark, S.S. “The New Normal – Preparing for climate change impacts on supply chain management”. Educational seminar hosted by the Western, NY Sustainable Business Roundtable. <https://shorturl.at/iyV26>
- P7. 2016. Clark, SS. “Resilience Summit” 2016 International Symposium of Sustainable Systems and Technology in Phoenix, AZ. The summit focused on creating a vision for a Multi-University Center for Resilient Infrastructure Systems. The objective was to identify key barriers to resilience as well as potential strategies for investigating and overcoming them from diverse disciplinary perspectives.
- P6. 2015. Clark, SS. “Interdisciplinary Resilience Summit”, 2015 International Symposium of Sustainable Systems and Technology in Dearborn, MI. The summit featured an expert panel on various perspectives of resilience, as well as a working session geared towards identifying barriers to interdisciplinary resilience research.
- P5. 2014. Clark, SS, Seager, TP. “The Pisces Game”, 2014 Society of Environmental Toxicology and Chemistry Annual Conference in Basel, Switzerland. The Pisces Game simulates the Tragedy of the

Commons, which describes the overexploitation of ‘common pool resources’ such as fisheries, national parks, and global warming. In the game participants are organized by ‘fishing villages’ (by zodiac sign) that share a common lake for survival. Players fish from the shared lake and make decisions related to fish conservation, consumption, capital investment, trading, or other transfers via Twitter.

- P4. 2013. Clark, SS, Seager, TP. “Sustainability Game: Tragedy of the Commons Digital Game for Ethics Education”, SETAC North America 34th Annual Meeting in Nashville, TN. This was an earlier version of ‘The Pisces Game’ workshop in Basel Switzerland, described above.
- P3. 2011. Seager, TP, Selinger, ES, Clark, SS, Sadowski, J. “Towards an Experiential Pedagogy of Sustainability Ethics Instructor Workshop”, Troy, NY. Instructors participated in a 2-day training workshop for successfully administering sustainability ethics games in the classroom.
- P2. 2014. Clark, SS, Thiel, C. “Structuring Critique: A workshop on how to effectively review a journal article”, 2014 International Symposium of Sustainable Systems and Technology in Oakland, CA. The session offered students an opportunity to learn how to effectively and professionally peer-review a journal article.
- P1. 2012. Clark, SS. “ISIE Future Faculty Forum”, 2012 International Symposium of Sustainable Systems and Technology in Boston, MA. A professional development session featuring a diverse panel of young faculty members that discussed their experience transitioning from being a graduate student to becoming a faculty member.

SELECT MEDIA COVERAGE

This section contains items that report on my research activities, or meaningfully discuss or reference my work, in the media – for example, by incorporating (oral or written) interviews with me about a topic on which I have subject-matter expertise, or citing findings produced by my research.

- Q20. 2024, 5 March. “UB-led team awarded \$750,000 NSF grant to study wildfire inequities - UBNOW: News and views for UB faculty and staff,” *UBNow*.
<https://www.buffalo.edu/ubnow/stories.host.html/content/shared/university/news/ub-reporter-articles/stories/2024/03/wildfire-inequities.detail.html>
- Q19. 2023, 14 April. “Susan Clark and Nicholas Rajkovich have been tapped for a NYS series exploring extreme heat and climate change,” *UBNow*.
<https://www.buffalo.edu/ubnow/stories/2023/04/extreme-heat-webinars.html>
- Q18. 2023, 2, November. “UB Team Participates in U.S. Department of Energy’s Justice Week to Help Efforts Towards Climate Resilience,” *UBNow*.
<https://arts-sciences.buffalo.edu/news-and-events/recent-news/2024/january/doe-justice-week-2023.html>
- Q17. 2023, 7 September. “Cities are advertising themselves as ‘climate havens.’ Experts say there’s no such thing,” *The Hill*.
<https://thehill.com/changing-america/sustainability/climate-change/4190038-cities-are-advertising-themselves-as-climate-havens-experts-say-theres-no-such-thing/>
- Q16. 2023, 14 July. “Local Heat puts KC Streetcar out of service for weeks. Are rails vulnerable to climate change?,” *The Kansas City Star*.
<https://www.kansascity.com/news/local/article277252048.html#storylink=cpy>.

[Yahoo! News](#) and others picked up the article.

- Q15. 2023, May 14. “State webinar series will feature pair of UB climate change experts,” *Niagara Gazette*.
https://www.niagara-gazette.com/news/local_news/state-webinar-series-will-feature-pair-of-ub-climate-change-experts/article_40eaa730-ef4b-11ed-ae54-136ade27300a.html
- Q14. 2023, 22 May. “10 Ways to Conserve Energy and Save Money,” *Money Talks News*.
<https://www.moneytalksnews.com/7-dumb-ways-you-waste-money-daily/>
- Q13. 2023, 8 March. “Sustainability’s SLICE Awards seek to inspire change,” *UBNow*.
<https://www.buffalo.edu/ubnow/stories/2023/03/slice-awards.html>
- Q12. 2023, 2 November. “New research fund focuses on civic engagement,” *UBNow*.
<https://www.buffalo.edu/ubnow/stories/2023/11/civic-engagement-research-fund.html>
- Q11. 2022, 6 May. “Study examines how better communication can boost recycling,” *UBNow*.
<https://www.buffalo.edu/ubnow/stories/2022/05/yang-recycling-communication.html>
- Q10. 2021, 16 August. “9 Actions You Can Take to Combat Climate Change,” *Bustle*.
<https://www.bustle.com/life/what-can-i-do-climate-change-experts>
- Q9. 2021, 23 October. “Music festivals face threats from climate change,” *The Washington Post*.
https://www.washingtonpost.com/lifestyle/style/covid-put-music-festivals-on-hold-climate-change-might-offer-bigger-long-term-problems/2021/10/21/f7863736-2c4f-11ec-985d-3150f7e106b2_story.html
- Q8. 2021, 16 August. “What you can do to combat climate change,” *Bustle*.
<https://www.bustle.com/life/what-can-i-do-climate-change-experts>
- Q7. 2021, 17 February. “UB makes foray into carbon offsets by partnering with green-tech platform,” *UBnow*.
<https://www.buffalo.edu/ubnow/stories/2021/02/ucapture.html>
- Q6. 2020, 15 September. “The Last-Ditch Talking Point on Climate Change,” *Current Affairs*.
<https://www.currentaffairs.org/2020/09/the-last-ditch-talking-point-on-climate-change>
- Q5. 2020, 21, August. “Heat is turbocharging fires, drought and tropical storms this summer,” *The Washington Post*.
<https://www.washingtonpost.com/climate-environment/2020/08/21/heat-climate-change-weather/>
The article was picked up by [MSN Canada](#), [The San Antonio News Express](#) and other news outlets. It was also referenced in [Clean Technica](#).
- Q4. 2020 8, July. “How America’s hottest city will survive climate change,” *The Washington Post*.
<https://www.washingtonpost.com/graphics/2020/climate-solutions/phoenix-climate-change-heat/>
Picked up by numerous outlets — including [The Hour](#), [The Week](#), [Houston Chronicle](#) and [MSN](#)
- Q3. 2020, 7 February. “Do Paper and Cotton Bags Actually Help the Environment?” *Spectrum News*,
<https://spectrumlocalnews.com/nys/binghamton/environment/2020/02/07/do-paper-and-cotton-bags-actually-help-the-environment->

- Q2. 2019, 26 August. “Stakeholders seek to develop Lower Great Lakes research network on sustainability and resilience,” *UBNow*.
<https://www.buffalo.edu/ubnow/stories/2019/08/renschler-great-lakes.html>
- Q1. 2010, 5 April. “Increasing Trend of Heavy Rain Events in Northeast Confirmed by Study,” *University of New Hampshire Newsroom*. <https://www.unh.edu/unhtoday/news/release/2010/04/05/increasing-trend-heavy-rain-events-northeast-confirmed-study>
 Picked up by numerous local outlets including the [Portland Press Herald](#), [Foster’s Daily Democrat](#), and [Press-Republican](#).

PROFESSIONAL DEVELOPMENT

- R12. Ongoing, CITI Research, Ethics, and Compliance Training
- R11. 2019, July. UBCMS Training – Content Management System, University at Buffalo
- R10. 2019, February. Native American Cultural Competency Training, University at Buffalo
- R9. 2018, August. Write Winning Grant Proposals Workshop, University at Buffalo
- R8. 2015, September. Using Social Media & Technology in the Classroom. Participated in 2 webinars: ‘Using Social Media without violating FERPA’ & ‘The Journey to Digital’.
- R7. 2014, October. Being a Leader: an OPPT-in Approach to Pedagogy Workshop. Three-day workshop about being a leader instead of learning about what leaders do. Organized by the Hugh Downs School Conflict, Transformation, and Wellness Initiative at ASU
- R6. 2013, February. R Statistical Computing Workshop
- R5. 2012, Summer. Preparing Future Faculty Program, Arizona State University. A nationally recognized professional development program for doctoral students interested in pursuing a faculty position upon graduation or completion.
- R4. 2012, September. Playing Games with a Purpose, Arizona Science Center. Session exploring the power of games in creating more engaging and effective education models for youth
- R3. 2012, April. Workshop on Communicating Climate Change. An online workshop for undergraduate faculty offered by the Climate Literacy and Energy Awareness Network (CLEAN)
- R2. 2012, June. Science Outside the Lab, Washington, DC. A two-week policy immersion program for science and engineering graduate students offered by the *Consortium for Science Policy and Outcomes*
- R1. 2011, October. Sustainable Energy Systems for Developing Countries, Uganda. A community-based, sustainable energy project to empower Ugandans to improve their energy access by teaching them how to build renewable and human powered electricity generating devices with locally available materials.

TEACHING

Legend: In the below section, I use the following notations: U = Undergraduate course, G = Graduate course, Δ = A course I designed or re-designed

- S10. **EVS 201, Climate Change & Sustainability (U Δ).** University at Buffalo
 This course is an interdisciplinary, introductory climate change course with a heavy focus on the human dimensions of the issue, including topics like climate justice, ethics, economics, policy, mitigation, and adaptation, which are important to the sustainability field. Students will also be exposed to foundational aspects of climate science as well so that students can talk about climate change in an informed manner. This course will feature a variety of guest speakers, offering different disciplinary and stakeholder perspectives on the issue of climate change. I have taught one in-person section of this class so far.
- S9. **EVS 489/589, Community Resilience to Natural Disasters (U&G Δ).** University at Buffalo
 This course explores the theoretical and conceptual underpinnings of resilience, as well as some popular metrics and indicators to measure community resilience. We also review and learn from case studies of disasters and disaster recovery. Students hear from a variety of guest speakers, representing different perspectives and disciplinary approaches to understanding resilience. I have taught one remote and one hybrid version of the course so far.
- S8. **SSN 501, Fundamentals of Sustainability (G Δ).** University at Buffalo
 Interdisciplinary graduate course that covers foundational theories and topics important for sustainability leadership. This class is required for students pursuing the Advanced Graduate Certificate in Sustainability, the M.A. in Sustainability Leadership, as well as the Engineering Sustainability M.S. program. I developed the curriculum and have taught 3 hybrid sections and 1 online section of this course so far.
- S7. **SOS 110, Sustainable World (U, Δ).** Arizona State University
 Large undergraduate course that covers the fundamental geological, biological, and social processes that create the world we live in and continue to maintain its viability for human life. The course is divided into three topic areas of sustainability: environmental, economic, and social systems. I developed the curriculum and taught 6 in-person sections, 1 hybrid version, and about a dozen sections online.
- S6. **IND 464, InnovationSpace (U).** Arizona State University
 Co-instructor and Sustainability mentor for a year-long capstone course with interdisciplinary team-based product development featuring applied projects for senior students from business, engineering, design, and sustainability. I supported this course for two years.
- S5. **SOS 498, Sustainable iProjects (U).** Arizona State University
 Co-instructor for a year-long capstone course where Sustainability students collaborate with Engineering students to integrate both Sustainability and Engineering practices into one methodology and apply the principles of Ray C. Anderson to sustainable manufacturing challenges. I supported this course for one year.
- S4. **SOS 515, Industrial Ecology and Design for Sustainability (G, Δ).** Arizona State University
 Co-instructor for a graduate level course focused on the conceptual, ethical, and practical challenges in the design, manufacture, and life cycle performance of products; environmental evaluation via materials flow analysis and life cycle assessment; global economic, environmental, cultural, and social aspects of competitive and functional product development and manufacture. I taught 1 section of this course.
- S3. **SOS 598, Sustainability Ethics (G, Δ).** Arizona State University
 Teaching assistant for graduate level course that uses a game-based pedagogy to immerse students in the salient ethical problems of sustainability, including environmental externalities, the Tragedy of the Commons, weak vs. strong sustainability, and intra-generational equity. Students formulate and test moral

hypotheses via on-line collaboration with multiple Universities simultaneously. I supported 4 sections of this course.

- S2. **HSD 598/CEE 598, Resilient Systems (G, Δ).** Arizona State University
Graduate seminar class focused on integrating interdisciplinary resilience perspectives. The class is geared towards students working on projects related to socio-technical resilience from engineering, social science, sustainability, and computer science departments. I have taught 2 sections of this course.
- S1. **GEOG 473, Elements of Weather.** University of New Hampshire
Teaching assistant for an undergraduate course that covers the basic principles of weather phenomena and the physical processes underlying these phenomena. I ran 4 lab sections each week for four semesters.

RESEARCH ADVISEMENT

Postdoctoral Fellows:

Kacey Stewart, (UB, current), Environmental Humanities

Dissertation Chair/Co-Chair:

Andrea Harder (UB, current). First student in the Sustainability PhD program.

Sara Peterson (UB, 2023), *From Energy Resilience to Community Resilience: Exploring the Links between Infrastructure Services & Human Wellbeing*, Research Associate at National Renewable Energy Laboratory. Sara graduated with a degree in Geography (no Sustainability PhD was available at the time).

Dissertation Committee Member:

Kahad Adamu (UB, current), School of Architecture and Planning

Johnny Thomas (ASU, 2017), School of Sustainable Engineering, *Human resilience and development in coupled socio-technical systems: A holistic approach to critical infrastructure*.

MA Project Chair (UB):

Daniel Conklin (current), *Evaluation for extreme heat: Challenges and opportunities in adaptation planning*, UB
Leah Bargnesi (current), *Village of Lancaster Climate Adaptation Planning and Outreach*. Supported by the UB Regional Institute and the NY State Climate Smart Communities Program.

Maddie Willett (current), *Exploring impacts of reduced ice cover on water quality in the Great Lakes as part of the City of Buffalo's Climate Vulnerability Assessment*.

Tobin Cahill (2023), *The Environmental and Social Impacts of Food Waste at UB*

Darius Huggins (2022), *A Greenhouse Gas Inventory to inform Mitigation Strategies: A Pilot Study of Victory Individual Residential Alternative Facility*

Samantha Horn (2022), *The Social Burden of Infrastructure Disruptions in Texas During Winter Storm Uri*

Sandra Notaro (2021), *A Guide to Utilizing an Equity-Based Resilience Scorecard*, Sustainability Specialist, Erie County

Committee Member, MA/MS (ASU):

Kaitlin Vortherms (ASU, 2015) School of Sustainable Engineering

Other:

Johnathon Townsend, Geography, UB (graduate research assistant)

Christie Rajcic, Engineering Sustainability, UB (graduate intern)

Michael Monzillo, Geography, UB (graduate intern)

Caroline Cameron, Environment & Sustainability, UB (undergrad summer intern)

Sadie Kratt, Environmental Geoscience, UB (undergraduate intern)

Lucien Hollins, Astronautical Engineering, ASU (student veteran research assistant)

Dustin Simmons, Biochemistry, ASU (student veteran research assistant)
Matthew Rodriguez, Sustainability, ASU (student veteran research assistant)
Katie Phillips, School of Sustainability, ASU (undergraduate BS thesis, committee member)
Albert Stanton, Sustainable Engineering, ASU (undergraduate BS thesis, committee member)

SERVICE

Professional Service:

- T5. Member, Collaborating Center on Health in Housing, a joint research effort by the School of Public Health and Health Professions and the School of Architecture and Planning at the University at Buffalo. 2024-2028.
- T4. Editorial Board for *Infrastructures*, 2019-
- T3. Guest Editor for a Special Issue: Resilient Infrastructure Systems (2019, ISSN 2412-3811): https://www.mdpi.com/journal/infrastructures/special_issues/resilient_infrastructure
- T2. International Symposium of Sustainable Systems and Technology (ISSST):
- Co-Chair of Sponsorship & Grants for 2021 Symposium
 - Chair of the ‘Socio-technical Resilient Infrastructure Systems’ theme for 2020 Symposium
 - Chair of the ‘Resilient Infrastructure Systems’ track for 2018 Symposium
 - Former Board of Directors & Faculty Advisor for ISSST student group
 - Session chair for resilience and education presentations
- T1. International Society for Industrial Ecology (ISIE):
- Student Chapter President, International Society for Industrial Ecology (ISIE), 2011-2012
 - Student Representative, International Society for Industrial Ecology (ISIE), 2010-2011
 - Member of Organizing Committee for the Symposium on Industrial Ecology for Young Professionals, June 11, 2011, Berkeley, CA

Research Proposal Reviewer:

- U6. National Science Foundation, Decision, Risk, and Management Sciences Program, ad hoc reviewer (2024)
- U5. National Science Foundation, Office of Integrative Activities, Panel Reviewer (2023, 2024)
- U4. Community Health Equity Research Institute, Health Equity Pilot Studies, reviewer 2024
- U3. Ohio Sea Grant, Great Lakes Research, external reviewer, 2023
- U2. NYS Climate Impact Assessment, external reviewer for NYSERDA, 2023
- U1. National Science Foundation, Directorate for Social, Behavioral and Economic Sciences, Panel Reviewer, Spring 2021

Professional Membership (Current & Former)

North American Alliance of Hazards and Disaster Research Institutes (NAAHDRI)
Social Science Extreme Events Research (SSEER)
Organizing Urban Transects for a Sustainable Transformation of Economic Partnerships (OUTSTEPS)
International Symposium on Sustainable Systems and Technology (ISSST)

International Society for Industrial Ecology (ISIE)
Human Development and Capability Association (HDCA)
American Geophysical Union (AGU)
Society of Environmental Toxicology and Chemistry (SETAC)
American Meteorological Society (AMS)

Manuscript Reviewer:

Earth's Future
Engineering Reports
Environment, Systems, and Decisions
Environmental Communication
Infrastructures
Integrated Environmental Assessment and Management
International Journal of Peace and Development Studies
Journal of Cleaner Production
Journal of Great Lakes Research
Nature Sustainability
PLOS one
Social Sciences & Humanities Open
Sustainability
Sustainable and Resilient Infrastructure
Sustainable Cities & Society

Public Service:

Volunteer for EarthEd Institute. Helping high school teachers integrate climate literacy content and activities into their classrooms (2022-)

Steering Committee Member for Erie County Low Income Program for Sustainable Energy (2022-)

Chair of Erie County Community Climate Change Task Force (2021-)

Member, Erie County Climate Change Task Force (2019-2021)

Member, Western New York, Sustainable Business Roundtable Education Committee (2018-2020)

Volunteer for 'career connections and exploration day' at the Churchville-Chili Middle School's Renewable Energy and Sustainability career day (2019-2021).

Service To Department:

Director, Sustainability Leadership M.A. Program (2021-)

Member, EVS Curriculum and Scheduling Committee (2022-)

Member, EVS Graduate Committee (2022-)

Member, EVS Department PhD Program Development Committee (2020-2022)

Member, Edward Kikta Chair of Experiential Learning Search Committee (2020)

Member, Environment and Sustainability Department Faculty Hiring Committee (2023-2024)

Member, Environment and Sustainability Department Faculty Hiring Committee (2019-2020)

Service To the University:

Member, UB Climate Action Planning Offsets Committee (2021-)

Member, Climate Change Health Equity Workshop Planning Committee (2021)

Sustainability Co-host, Boldly Buffalo Virtual Campaign (April, 2021)

Judge for UB's World Challenge Challenge, UB Sustainability (April, 2021)
Member, Sustainability Education Working Group that created the Sustainability Leadership MA program, UB
(2017-2020)
Faculty Advisor, Business Sustainability Club and Global Environmental Brigade, ASU (2015-2017)

ENTREPRENEURSHIP AND INNOVATION

V2. Faculty Mentor, The Opportunity Project Innovation Sprint (Fall 2023)

Mentored a team of five data science and computer science students at UB in response to the Department of Energy and US Census Bureau's 'Improving Access to Electrical Power for Climate Resilience' Innovation Sprint. The challenge was for the team to develop a digital tool to help address the following issues: 1) inform investments in grid resilience and restoration, 2) deliver immediate benefits to our existing emergency response systems during power outages, and/or 3) provide visibility into disparities in energy access. I provided weekly mentorship to the team to help them develop a phone app inspired by the needs of Buffalo residents, following the 2022 Buffalo Blizzard.

V1. Vice President, Curriculum Development, XSET Games, Inc. (2012-2017)

Experiential Sustainability Ethics Training (XSET) Games offers a set of novel digital games designed for teaching ethics (both in the classroom and in corporate settings) that center participants in classic and irreconcilable sustainability problems, including the Tragedy of the Commons and Environmental Externalities. XSET Games is predicated on the NSF funded award 'An Experiential Approach to Sustainability Ethics'.

AWARDS

Travel Awards:

November 2-3, 2023. Michigan Sea Grant Coastal Resilience Workshop (funded by Michigan Sea Grant). Ann Arbor, Michigan. \$1000

April 20-23, 2023. The Climate Governance Variability in the Great Lakes Annual Meeting (sponsored by NSF RCN). Duluth, Minnesota

SETAC Europe travel support for running XSET Games workshop in Basel, Switzerland. Workshop Lead and Organizer. Funded by the Society of Environmental Toxicology and Chemistry. \$4,500

Leadership Program on Teaching through Research. Participant. Funded by the Centre for Research and Interdisciplinarity, Paris. \$2,000

Professional/Academic Awards:

Sustainability SLICE Faculty Award (2022)

Women in STEM Summit Panelist at UB (2018)

Arizona State University, summa cum laude (2013)

University of New Hampshire, magna cum laude (2008)

University of New Hampshire, Teaching Assistant Fellowship (2007)

University at Albany, magna cum laude & valedictorian of department (2006)

Athletic Awards:

University at Albany, Chancellor's Scholar Athlete Award (2005)

America East Conference Scholar Athlete Award (2005)
University at Albany, Commitment to Excellence Athletic Award (2004)
Four-year starter, Division I Volleyball Athletic Scholarship to UAlbany (2001-2005)