

# Kelsea B. Best, PhD

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## **Assistant Professor - Urban Climate Resilience and Adaptation Disparities**

The Ohio State University

Department of Civil, Environmental, and Geodetic Engineering

City and Regional Planning, Knowlton School of Architecture

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**Google Scholar:** <https://scholar.google.com/citations?user=isMyIb4AAAAJ&hl=en>

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**RESEARCH INTERESTS:** coupled human-natural systems in coastal communities, environmental migration, agent-based modeling, equitable adaptation to climate change, climate resilience, climate gentrification, machine learning

### **EDUCATION**

**Vanderbilt University**, Nashville, TN

Ph.D. Earth and Environmental Sciences, 2022

Dissertation: “Dynamics of Environmental Change, Livelihoods, and Migration in Bangladesh: An agent-based modeling approach”

Committee: Jonathan Gilligan (chair), Hiba Baroud, Amanda Carrico, David Furbish, Steve Goodbred

**Vanderbilt University**, Nashville, TN

M.S. Earth and Environmental Sciences, 2019

Thesis: “A Data-Driven Analysis of Environmental Migration in Coastal Bangladesh”

Committee: Jonathan Gilligan (chair), Hiba Baroud, David Furbish

**Princeton University**, Princeton, NJ

B.S.E. Chemical and Biological Engineering, 2015

Concentration: Environmental Studies

### **EMPLOYMENT**

**Assistant Professor**, the Ohio State University (*August 2023-present*)

Department of Civil, Environmental and Geodetic Engineering (70% appointment)

City and Regional Planning Section of the Knowlton School (30% appointment)

Race, Inclusion and Social Equity (RAISE) initiative faculty

**Postdoctoral Researcher**, University of Maryland, (*June 2022-August 2023*)

Department of Civil and Environmental Engineering

**Graduate Research Assistant**, Vanderbilt University, (*2017-2022*)

Department of Earth and Environmental Science,

NSF Coupled Human-Natural Systems Grant No. 1716909

**Graduate Research Assistant**, Vanderbilt University (*December 2020- 2022*)

Grand Challenge on Climate and Society

## PUBLICATIONS

### **Journal publications** (Student authors underlined)

- 1) “Statistical learning to identify salient factors influencing FEMA Public Assistance outlays” Ghaedi, H., **Best, K.**, Reilly, A., Niemeier, D. (*accepted, Natural Hazards*)
- 2) “Under-reported and under-served: Disparities in U.S. disaster federal aid-to-damage ratios after hurricanes” Waters, L., **Best, K.**, Miao, Q., Davlasheridze, M., Reilly, A. (*accepted, International Journal of Disaster Risk Reduction*)
- 3) “Demographics and risk of isolation due to sea level rise in the United States” **Best, K.B.**, He, Q., Reilly, A.C., Niemeier, D., Anderson, M., Logan, T., *Nature Communications* <https://doi.org/10.1038/s41467-023-43835-6> (2023)
- 4) “Rent affordability after hurricanes: Longitudinal evidence from U.S. coastal states” **Best, K.B.**, He, Q., Reilly, A., Tran, N., Niemeier, D., *Risk Analysis* <https://doi.org/10.1111/risa.14224> (2023)
- 5) “Growth ≠ Density: Zoning deregulation and the enduring problem of sprawl”, Serkin, C., Best, K., *Pepperdine Law Review* 50 (3): 557–78 <https://digitalcommons.pepperdine.edu/plr/vol50/iss3/3> (2023)
- 6) “How do migration decisions and rivers differ against extreme environmental events?” Mallick, B., **Best, K.B.**, Carrico, A., Ghosh, T., Priodarshini, R., Sultana, Z., Samanta, G., *Environmental Hazards* <https://doi.org/10.1080/17477891.2023.2195152> (2023)
- 7) “Spatial regression identifies socioeconomic inequality in multi-stage power outage recovery after Hurricane Isaac” **Best, K.B.**, Kerr, S., Reilly, A.C., Niemeier, D., Patwardhan, A., Guikema, S. *Natural Hazards* <https://doi.org/10.1007/s11069-023-05886-2>. (2023)
- 8) “Vulnerability to climate gentrification is increasing along the U.S. East Coast” **Best, K.B.**, Jouzi, Z., Islam, S., Kirby, T., Nixon, R., Hossan, A., Nyiawung, R. *Urban Climate* 48:101430. <https://doi.org/10.1016/j.uclim.2023.101430> (2023)
- 9) “Place attachment, environmental perceptions, and migration in south-western Bangladesh” **Best, K.B.**, Carrico, A., Donato, K., Mallick, B. *Translational Issues in Psychological Science* <https://doi.org/10.1037/tps0000347> (2022)
- 10) “Applying Machine Learning to Social Datasets: A Study of Migration in Southwestern Bangladesh Using Random Forests” **Best, K.B.**, Gilligan, J., Baroud, H., Carrico, A., Donato, K., Mallick, B. *Regional Environmental Change*. <https://doi.org/10.1007/s10113-022-01915-1> (2022)
- 11) “Climate Gentrification: Methods, Gaps, and Framework for Future Research”, **Best, K.**, & Jouzi, Z.. *Frontiers in Climate*, 4. <https://doi.org/10.3389/fclim.2022.828067> (2022)
- 12) “Modeling multi-level patterns of environmental migration in Bangladesh: An agent-based approach” **Best, K.B.**, Qu, A., Gilligan, J. In *2021 Winter Simulation Conference (WSC)*. <https://doi.org/10.1109/WSC52266.2021.9715380> (2021)
- 13) “The risks of invisibilization of populations & places in environment-migration research”, Borderon, M., **Best, K.B.**, Bailey, K., Hopping, D.L., Dove, M.C., Cervantes de Bloise, C.L. *Humanities and Social Sciences Communications*, 8(1), 1–11. <https://doi.org/10.1057/s41599-021-00999-0> (2021)
- 14) “Data-driven decision support tools for assessing the vulnerability of community water systems to groundwater contamination in Los Angeles County” **Best, K.**, Miro,

- M., Kaynar, N., Kirpes, R., Chesler Najera, A. *Environmental Science and Policy*, 124, 393–400. <https://doi.org/10.1016/j.envsci.2021.07.015> (2021).
- 15) “Extreme weather and marriage among girls and women in Bangladesh” Carrico, A. R., Donato, K. M., **Best, K. B.**, & Gilligan, J. *Global Environmental Change*, 65, 102160. <https://doi.org/10.1016/j.gloenvcha.2020.102160> (2020)
- 16) “A first-order geochemical budget for suspended sediment discharge to the Bay of Bengal from the Ganges-Brahmaputra river system” Dietrich, M., **Best, K.B.**, Raff, J.L., Ronay, E.R. *Science of the Total Environment*, doi:[10.1016/j.scitotenv.2020.138667](https://doi.org/10.1016/j.scitotenv.2020.138667) (2020)
- 17) “Random Forest Analysis of Two Household Surveys Can Identify Important Predictors of Migration in Bangladesh” **Best, K.B.**, Gilligan, J., Baroud, H., Carrico, A., Donato, K., Ackerly, B., Mallick, B. *Journal of Computational Social Science*, <https://doi.org/10.1007/s42001-020-00066-9> (2020)
- 18) “Bioconjugated Core–Shell Microparticles for High-Force Optical Trapping” Cordova, J.C., Reinemann, D.N., Laky, D.J., Hesse, W.R., Tushak, S.K., Weltman, Z.L., **Best, K.B.**, Bardhan, R., Lang, M.J. *Particle & Particle Systems Characterization* (2018)

#### **Journal publications in review** (Student authors underlined)

- “Where did the money go? Assessing the distribution of the Community Development Block Grant- Disasters Recovery Funds” Miao, Q., **Best, K.**, Reilly, A., Davlasheridze, M. (*in review, American Review of Public Administration*)
- “Providing for occupant experience in optimized connected energy communities- A critical review” Ramsey, P., Gingerich, D., **Best, K.**, Stockar, S., Duarte, C., Clark, J. (*in review, Energy & Buildings*)
- “Intergenerational non-migration of women facing environmental risk” Mallick, B., van den Berg, J., **Best, K.**, Bailey, A., Hunter, L. (*in review, Regional Environmental Change*)
- “Bridging community resilience and local planning for climate justice”, **Best, K.**, He, Q., Flores, A., Gu, D., Howell, J., Johnson, D., Liao, Y., Reilly, A., Rumbach, A., Sheldon, T., Siders, A.R., Wong-Parodi, G., Young, R. Niemeier, D. (*in review, Climatic Change*)
- “How do hurricanes and federal aid affect eviction risk? Decade-long evidence from the United States” He, Q., **Best, K.**, Reilly, A., Niemeier, D. (*in review, Journal of Planning Education and Research*)

#### **Books**

- “Migration and Displacement in a Changing Climate”, **Kelsea Best**, Kayly Ober, and Robert McLeman, Cambridge University Press (in press)

#### **Book chapters**

- “Approaches to Analyzing the Vulnerability of Community Water Systems to Groundwater Contamination in Los Angeles County” Miro, M. E., **Best, K.**, Kaynar, N., Kirpes, R., & Najera Chesler, A. In M. Lee & A. Najera Chesler (Eds.), *Research in Mathematics and Public Policy* (pp. 19–28). Cham: Springer International Publishing. [https://doi.org/10.1007/978-3-030-58748-2\\_2](https://doi.org/10.1007/978-3-030-58748-2_2) (2020)

#### **Software**

- “bestkb/Environmental-Migration-ABM-Public: Winter Sim 2021 Version (1.1.0)”

[Computer software] **Best, K.** Zenodo.  
<https://doi.org/10.5281/ZENODO.4526330> (2021)

### **Other publications**

“The topic of clean energy has been neglected in mayoral election” **Best, K.B.**, Tasich, C.M., The Tennessean Newspaper, Opinions, (July 19, 2019)

## **GRANTS AND FELLOWSHIPS**

### **Current Research Funding**

- 1) U.S. Environmental Protection Agency, Drivers and Environmental Impacts of Energy Transitions in Underserved Communities, “FLEETS for All: Facilitating Local Electrified Energy and Transportation Services for All”, PI: Bielicki, Co-I’s: **Best**, Gingerich, Hood, Jacquet, Le, May, Total grant = \$1,120,313 (July 2023 – June 2026)
- 2) The Sustainability Institute at the Ohio State University, Sustainability Research Seed Grant, “Assessing and enhancing climate resilience of LGBTQIA+ populations in Ohio”, PI: **Best**, Co-Is: Wong (Geography), Rao (Social Work), Total grant= \$30,500 (April 2024 – April 2025)
- 3) Ohio Water Resources Center, “Socio-technological evaluation of treatment for arsenic contamination of private wells in Licking County, Ohio”, PI’s: **Best** and Lenhart, Total grant = \$84,717 (September 2024 – September 2025)
- 4) The Sustainability Institute at the Ohio State University, SI Student Award, “Socio-technological evaluation of treatment for arsenic contamination of private wells in Licking County, Ohio”, student: Flamm, PI’s: **Best** and Lenhart, Total grant = \$5,000 (April 2024 – April 2025)
- 5) The Sustainability Institute at the Ohio State University, Sustainability Research Seed Grant, “Just transition to electric vehicles: centering mobility, housing, and energy equity”, PI: Le, Co-Is: Best, Bielicki, Carrel, Rao, Total grant= \$25,125 (April 2024 – April 2025)
- 6) University of Colorado, Boulder Population Center Seed Grant, “Heat Stress and Infant Health Outcomes in Bangladesh”, PI: Carrico, Co-PIs: **Best**, Donato, Total grant = \$15,000

### **Previous Research Funding**

- 1) Environments Graduate Student Fellowship and Cohort Leader, 2021-2022, The Robert Penn Warren Center for the Humanities and the Climate and Society Grand Challenge Initiative, Vanderbilt University (\$2,500)
- 2) Curb Center Public Scholar, 2020-2022 Cohort, The Curb Center for Art, Enterprise & Public Policy, Vanderbilt University (\$2,000)
- 3) 2020 Critical Language Scholarship Finalist in Bangla, American Councils for International Education (\$750)
- 4) Socio-Environmental Analysis of Climate Gentrification along the East Coast of the United States (PI) 2020 National Socio-environmental Synthesis Center (SESYNC) Graduate Pursuit (\$14,000 for stipends)
- 5) Student scholarship, Community Surface Dynamics Modeling System Annual Meeting, Boulder, CO (\$600), March 2020 (meeting in person canceled)
- 6) Alberstadt-Reesman-Stearns Fund, Vanderbilt Earth and Environmental Sciences, Nashville, TN (\$2,000), October 2019

- 7) Early Career Scientist Grant, Environmental Non-migration: Framework, Methods, and Cases Conference in Dresden, Germany (€500), June 2019
- 8) AAAS Dialogue on Science, Ethics, and Religion Engaging Scientists in the Science and Religion Dialogue Public Engagement Contest (\$1,000), May 2019
- 9) Travel award, Climate Change, Human Migration and Health: Integrating social and environmental data to accelerate innovative science, University of Colorado Boulder (\$500), May 2019
- 10) Vanderbilt Graduate School Travel Grant (\$500), November 2018
- 11) National Merit Scholarship, 2011-2015

### **AWARDS AND HONORS**

- 1) Nature Communications Top 25 Social Science and Human Behavior Articles of 2023 for “Demographics and risk of isolation due to sea level rise in the United States”
- 2) MIT Rising Stars in Civil and Environmental Engineering, Massachusetts Institute of Technology, Boston, MA, 2021
- 3) Winner, Graduate Leadership Anchor Awards, Vanderbilt University, 2021
- 4) Finalist and third place overall, Three Minute Thesis (3MT) Competition, Vanderbilt University, 2021
- 5) Ward Prize for Creative Writing, Princeton University, 2015

### **PRESENTATIONS**

#### **Invited talks**

- 1) STEAM Factory STEAM Exchange, “Climate change and migration in Bangladesh”, the Ohio State University, March 21, 2024
- 2) Center for Automotive Research (CAR) Spring Seminar, “High and Dry: Isolation due to sea level rise in the U.S.”, the Ohio State University, February, 2024
- 3) Byrd Center for Polar and Climate Research Fall Seminar, “Climate Change, Housing, and Implications for Equitable Adaptation”, the Ohio State University, December, 2023
- 4) 2023 Interdisciplinary Research Fall Forum: Computational Approaches for a Just and Sustainable World, Panel Discussion on “Climate Resilience, Equity, and Justice: Intersecting Frameworks for a Sustainable Change”, the Ohio State University, November, 2023
- 5) City and Regional Planning Colloquium, Panel member, October, 2023
- 6) National Geospatial-Intelligence Agency, “Environmental Migration in Bangladesh”, February, 2023
- 7) University of Maryland Center for Disaster Resilience, “Social and Economic Disparity in Isolation Risk due to Sea Level Rise in the United States”, December 2022
- 8) Climate, Migration, and Human Security, the World-Wide Human Geography Data Working Group (WWHGD), “Environmental Migration in Bangladesh: Internal and International Implications”, November 2022
- 9) University of Maryland Center for Disaster Resilience, “Equity Implications of Disasters: from COVID-19 to Future Sea Level Rise” with Qian He, September 2022

- 10) Vanderbilt University Distinguished Lecture Series, Voicing Complexity: Publicness, Ethics, and Politics, “Modeling as Political Engagement: Active Mobility and Climate Change” panel with Dr. Pratim Sengupta, Dr. Jonathan Gilligan, and Karly Ross, March 2021
- 11) STEM Consortium: Girls in STEM micro conference, “Justice, Equity, Diversity, and Inclusion (JEDI) in STEM: An example from the geosciences”, February 2021
- 12) Graduate Climate Conference (virtual), Panelist, “AI Methods in Climate”, October 2020
- 13) Federation of American Societies for Experimental Biology (FASEB), “Mental Health Matters: Finding Space in a University Setting”, May 2020
- 14) Mote Marine Laboratory and Aquarium Endless Oceans Adult Education Program, Climate Science and the Ocean, November 2018
- 15) Graduate Administrators & Coordinators Regional Conference, Vanderbilt University, Panel, An Inside Look at How Graduate Students Perceive Campus Safety and Wellbeing, October 2018
- 16) Vanderbilt Center for Talented Youth VSA Talks, Vanderbilt University, “Changing with the Tides: Environmental Migration in Bangladesh”, July 2018
- 17) Earth and Environmental Science Research Gala, Vanderbilt University, “Women in Earth and Environmental Science”, January 2018
- 18) Invited Lecture, Wake Forest University School of Business, “Packaging Innovation and Sustainability”, January 2016
- 19) Invited Lecture, Rice University School of Business Net Impact Club, “Sustainable Procurement at ExxonMobil”, November 2015

#### **Oral presentations**

- 1) American Association of Geographers (AAG) Annual Meeting, “LGBTQ+ Populations’ Risk of Displacement after a Disaster in the United States”, April 2024
- 2) Society for Risk Analysis (SRA) Annual Meeting, Washington, DC, “Rent Affordability after Hurricanes: Longitudinal Evidence from U.S. Coastal States”, December, 2023
- 3) 2023 Interdisciplinary Research Fall Forum: Computational Approaches for a Just and Sustainable World, “Isolation due to sea level rise will disproportionately burden vulnerable populations in the United State”, November, 2023
- 4) Gentrification and Displacement: What can we do about it?, “Climate change and housing justice”, Boston University, October 2023
- 5) Association of Collegiate Schools of Planning (ACSP) Annual Conference, “Spatial regression identifies socioeconomic inequality in multi-stage power outage recovery after Hurricane Isaac”, Chicago, Illinois, October 2023
- 6) At What Point Managed Retreat? Habitability and Mobility in an Era of Climate Change, “Climate change and housing justice: implications for equitable adaptation”, Columbia University, June 2023
- 7) American Association of Geographers (AAG) Annual Meeting, “Disasters, Rent Affordability, and Evictions: Longitudinal evidence from the United States”, March 2023
- 8) Society for Risk Analysis (SRA) Annual Meeting, Tampa, Florida “Social and Economic Disparity in Isolation Risk due to Sea Level Rise in the United States”, December 2022

- 9) NSF Funded Coastlines and People (CoPe) Workshop, Florida International University, “Social and Economic Disparity in Isolation Risk due to Sea Level Rise in the United States”, October, 2022
- 10) Gobeshona Global Conference, session on non-migration as local-led adaptation in the context of climate change, “Mapping Narratives of Environmental Migrants in Dhaka”, March 2022
- 11) American Association of Geographers (AAG) Annual Meeting, “Machine learning for climate gentrification research”, February 2022
- 12) RISKKAN Workshop on Understanding and Modeling Complex Risks in Coupled Human-Environment Systems, “Combined machine learning and agent-based modeling for studying environmental migration dynamics”, February 2022
- 13) Winter Simulation Conference 2021, “Modeling Multi-Level Patterns of Environmental Migration in Bangladesh: An Agent-Based Approach”, December 2021
- 14) Winter Simulation Conference 2021 PhD Colloquium, “Modeling Multi-Level Patterns of Environmental Migration in Bangladesh: An Agent-Based Approach”, December 2021
- 15) At What Point Managed Retreat? Resilience, Relocation and Climate Justice virtual conference, “Identifying Climate Gentrification Across the East Coast of the United States: A Machine Learning Approach”, June 2021
- 16) Women in Data Science (WiDS) Raleigh and Nashville: Data Science in Coupled Human and Natural Systems, virtual, “Mixed-methods Data Science for Environmental Migration”, April 2021
- 17) Environmental Non-migration: Framework, Methods, and Cases, Dresden, Germany, “Applying Machine Learning to Social Datasets: A Study of Migration in Southwestern Bangladesh Using Random Forests”, June 2019
- 18) AGU Fall Meeting, Washington D.C., “A Machine Learning Analysis of Multiple Social Surveys to Understand Environmental Migration in Coastal Bangladesh”, December 2018

### **Conferences and Sessions Organized**

- Workshop lead, Community Surface Dynamics Modeling System (CSDMS) 2024 Annual Meeting, Monclair State University, Monclair, NJ, “Introduction to Agent-Based Modeling for Socio-Environmental Systems”, May 2024
- Organizer, American Association of Geographers (AAG) Annual Meeting, Pre-organized session, “Intersectional approaches to climate and disaster resilience research”, Honolulu, Hawaii (hybrid), April 2024
- Organizer, Byrd Center for Polar and Climate Research and Center for Urban and Regional Analysis Seminar, “Unpacking the 5th U.S. National Climate Assessment for the Midwest & Flash Talks Highlighting Climate Resilience Partnerships in Central Ohio”, Columbus, Ohio, April 2024
- Organizer, Association of Collegiate Schools of Planning (ACSP) Annual Conference, Pre-organized session: Addressing social equity and racial justice in climate adaptation and community resilience: Emerging Perspectives and Research Methods, Chicago, Illinois, October 2023
- Discussant, Association of Collegiate Schools of Planning (ACSP) Annual Conference, Pre-organized session: Addressing social equity and racial justice in climate

- adaptation and community resilience: Emerging Perspectives and Research Methods, Chicago, Illinois, October 2023
- Organizer, At What Point Managed Retreat? Habitability and Mobility in an Era of Climate Change, “Resilient, Equitable, and Sustainable Infrastructure for Coastal Communities: Challenges and Opportunities”, Columbia University, June 2023
- Organizer, American Association of Geographers (AAG) Annual Meeting, “Emerging research methods for social and economic equity in community resilience and climate adaptation research”, March 2023
- Convener, Estuarine Coastlines and People (CoPe) Workshop: Closing the Gap Between Science and Implementation in Coastal Adaptation, Annapolis, MD (*November 14-15, 2022*)
- Panel moderator, “Marsh shoreline projects: marsh processes, financing, social interactions” and “Beyond the individual project: ecosystem interactions, hydrodynamics, regional policy and infrastructure”
- Organizer, American Association of Geographers (AAG) Annual Meeting, “Climate gentrification: Emerging themes and methods”, February-March 2022
- Poster presentations and conference abstracts**
- National Adaptation Forum (NAP), “Supporting Equitable, Community-Engaged, and Culturally Appropriate Climate Relocation”, Best, K., Hotchkiss, E., Stout, S., Temerson, J., Minneapolis, MN, May 2024
- Association for Public Policy Analysis and Management (APPAM), “When Federal Disaster Aid Doesn’t Suffice: An Equity Analysis Considering Disaster Aid Relative to Sustained Damage”, Waters, L. **Best, K.**, Reilly, A., Miao, Q., Davlasheridze, M., November 2023
- Association for Public Policy Analysis and Management (APPAM), “Where did the money go? Assessing the distribution of the Community Development Block Grant Disaster Recovery Funds”, Miao, Q. **Best, K.**, Reilly, A., Davlasheridze, M., November 2023
- Natural Hazards Research Summit, Washington, D.C., “Social and Economic Disparity in Isolation Risk due to Sea Level Rise in the United States”, **Best, K.B.**, He, Q., Reilly, A.C., Logan, T., Niemeier, D., Jin, S., Anderson, M., October, 2022
- Population Association of America (PAA) Annual Meeting, Atlanta, GA, “Place attachment, community cohesion, and migration in southwestern Bangladesh”, **Best, K.B.**, Carrico, A., Donato, K., Mallick, B., April 2022
- Population Association of America (PAA) Annual Meeting, Atlanta, GA, “Women’s Internal Migration in Bangladesh: Investigating Type, Timing, and Environmental Intersections”, Burns, H., Carrico, A., Donato, K., Mallick, **Best, K.B.**, April 2022
- CSDMS Annual Fall Meeting, University of Colorado Boulder (virtual), “Pattern-oriented modeling to test frameworks of environmental migration decisions in Bangladesh”, May 2021
- AGU Fall Meeting, virtual, “An agent-based model of migration and environmental shock in Bangladesh”, December 2020
- Graduate Climate Conference, virtual, “Number of dangerous heat days in Bangladesh will increase with future climate



change”, October 2020  
 CSDMS Annual Fall Meeting, University of Colorado Boulder,  
 “Environmental Migration and Land Inundation: An Agent-Based Modeling  
 Approach”, May 2019  
 Climate Change, Human Migration and Health: Integrating social and environmental data  
 to accelerate innovative science, University of Colorado Boulder,  
 “Machine Learning to Understand Salient Variables in Models of Migration in  
 Southwestern Bangladesh”, May 2019  
 Data Science Symposium, Vanderbilt University,  
 “Environmental Migration in Bangladesh: Insights from Machine Learning”,  
 April 2019  
 Graduate Climate Conference, University of Washington,  
 “Dynamics of Changing Environment, Livelihood, and Migration in  
 Bangladesh”, November 2018  
 CSDMS Annual Fall Meeting, University of Colorado Boulder,  
 “Machine Learning to Predict Migration in Coastal Bangladesh”, May 2018  
 Advanced Spatial Analysis Poster Session, Vanderbilt University,  
 “Spatial Analysis of Internal Migration and Proximity to Transportation Networks  
 in Southwestern Bangladesh”, April 2018  
 Data Science Symposium, Vanderbilt University,  
 “Machine Learning to Predict Migration in Coastal Bangladesh”, March 2018  
 Earth and Environmental Science Research Gala, Vanderbilt University-  
 “Migration Decisions: A random forest approach”, January 2018  
 Chemical Engineering Senior Thesis Presentations, Princeton University,  
 “Optimization of Root Depth Profile to Improve Representation of Dynamic  
 Rooting Decisions of Two Tree Species”, April 2015  
 Environmental Studies Senior Thesis Presentations, Princeton University,  
 “Optimization of Root Depth Profile to Improve Representation of Dynamic  
 Rooting Decisions of Two Tree Species”, April 2015

## **STUDENT MENTORING**

### **PhD advising:**

- 1) Cyenna Miller, the Ohio State University, Environmental Students Graduate Program (ESGP) (Fall 2024-present)
- 2) Yunjeong Song, the Ohio State University, City and Regional Planning, co-advised with Dr. Maria Conroy (Fall 2024-present)

### **Master’s degree advising:**

- 1) Chloe Green, City and Regional Planning, co-advised with Dr. Harley Etienne (exp. 2025)
- 2) Abbi Flamm, Civil, Environmental & Geodetic Engineering, co-advised with Dr. John Lenhart (exp. 2025)

### **Postdoctoral Researchers:**

- 1) Woi Sok Oh, the Ohio State University, Civil, Environmental & Geodetic Engineering (August 2024 – August 2025)

### **PhD thesis committee:**

- 1) Mohammed Ahmed, the Ohio State University, Civil, Environmental & Geodetic

Engineering (exp. 2025)

- 2) Garrett Tatum, the Ohio State University, Civil, Environmental & Geodetic Engineering (Spring 2024)
- 3) Mia Renna, the University of Maryland, Civil and Environmental Engineering (exp. 2025)

**Master's thesis committee:**

- 1) Saeed Alhusaiki, the Ohio State University, Landscape Architecture (exp. 2024)
- 2) Farrah Hasan, University of Washington, School of International Studies (exp. 2024)
- 3) Cassidy Jensen, the Ohio State University, Department of Civil, Environmental & Geodetic Engineering (Spring 2024)

**PhD Candidacy exams:**

Yashvi Malhotra, Civil, Environmental, and Geodetic Engineering (exam May 2024)

**Undergraduate research assistants:**

**Current**

- 1) Mia Matteucci, Colorado College, Department of Environmental Studies
- 2) Nancy Zhu, the Ohio State University, School of Environment and Natural Resources
- 3) Yusen Peng, the Ohio State University, Computer Science and Engineering
- 4) Zuhur Sofe, the Ohio State University, Electrical and Computer Engineering

**Former**

- 5) Oluwatobi Ajiboye, University of Maryland, Civil and Environmental Engineering
- 6) Vahin Reddy, University of Maryland, Civil and Environmental Engineering
- 7) Nhi Tran, University of Maryland, Civil and Environmental Engineering
- 8) Annushka Aliev, University of Maryland, Civil and Environmental Engineering
- 9) Maham Sohail, University of Maryland, Civil and Environmental Engineering
- 10) Erin McCubbin, University of Maryland, Civil and Environmental Engineering
- 11) Jim Peng, University of Maryland, Civil and Environmental Engineering
- 12) Robin Young, Vanderbilt University, Earth and Environmental Sciences
- 13) Farrah Hasan, Vanderbilt University, Earth and Environmental Sciences

**Undergraduate student summer projects:**

- 1) Alanis Diaz (OSU CEGE Summer REU, 2024)
- 2) Nicolas Bartolomeo (OSU Summer Research Opportunities Program, 2024)
- 3) Mia Matteucci (NSF REU, 2023)
- 4) Joshua McDuffie (Vanderbilt, Leadership Alliance Summer Program, 2019)

**TEACHING**

**Instructor and Course Design**

- ENVENG 3200/6200: Fundamentals of Environmental Engineering, The Ohio State University (Spring 2024)
- Difficult Subjects: Community of Practice on Climate Justice, The Ohio State University Global Arts and Humanities Discovery Theme, for K-12 teachers in Central Ohio (*January 2024 – June 2024*)
- STEM Summer Institute, The Harpeth Hall School, Nashville, TN (*June 14-18, 2021*)
- STEM Summer Institute, The Harpeth Hall School, Nashville, TN (*June 10-14, 2019*)
- “Climate Change: Where Policy Meets Science”, Vanderbilt Summer Academy in Program for Talented Youth, Nashville, TN (*January 2018-July 2018*)

**Head Graduate Teaching Assistant**

- Probability and Statistics, Vanderbilt University, Nashville, TN (Spring 2022-graduate and undergraduate level)
- Climate and Society: Drowning Cities, Vanderbilt University, Nashville, TN (Fall 2020- graduate and undergraduate level)
- Global Climate Change, Vanderbilt University, Nashville, TN (Fall 2018, Spring 2020- graduate and undergraduate level)

#### **Graduate Teaching Assistant**

- Oceanography, Vanderbilt University, Nashville, TN (Fall 2017)

#### **Guest Lecturer**

- 1) CE3530: Learning from Disasters, the Ohio State University Civil, Environmental & Geodetic Engineering (*Spring 2024*), “Isolation due to sea level rise in the US” (4/2)
- 2) CRP 5880: Data Analytics, the Ohio State University City and Regional Planning (*Spring 2024*), “Modeling environmental migration in Bangladesh” (3/20)
- 3) RS 5540: Service Learning, the Ohio State University School of Natural Resources and the Environment, (*Spring 2024*), “Equitable Climate Adaptation” (2/8)
- 4) Agent-based modeling of People, Health, and the Environment, Boston University (12/7/23)
- 5) PUBAFRS 6020: Foundations of Data Driven Sustainable Energy Systems, the Ohio State University, (*Fall 2023*)- “Human and Environmental Impacts of Energy Systems: Parts 1 and 2” (10/24 and 10/31)
- 6) Data Analytics for Engineers, Vanderbilt University, Nashville, TN, (*Spring 2023*)- “Random forest analysis of two household surveys can identify important predictors of migration in Bangladesh: From Project to Publication” (4/12)
- 7) Graduate Seminar on Risk and Resilience, University of Maryland, College Park, MD (*Fall 2022*)- “Social and Economic Disparities of Isolation Risk due to Sea Level Rise in the U.S.” (10/5)
- 8) Introduction to Literary and Cultural Analysis, Vanderbilt University, Nashville, TN (*Spring 2022*)- “Climate and Migration in Bangladesh” (2/24)
- 9) Regional Perspectives of Environmental Migration and Non-migration, Technical University of Dresden, Dresden, Germany (virtual) (*Spring 2022*)- “Interdisciplinary methods and teams for environmental migration research”
- 10) Nations, Borders, and Migration, Appalachian State University, Boone, NC (virtual) (*Spring 2021*)- “Climate and Migration: The Case of Bangladesh” (3/11)
- 11) Social Contexts of Public Policy, Vanderbilt University, Nashville, TN (*Spring 2021*)- “Data invisibility in climate migration research” (2/24)
- 12) Data Analytics for Engineers, Vanderbilt University, Nashville, TN, (*Fall 2020*)- “Random forest analysis of two household surveys can identify important predictors of migration in Bangladesh: From Project to Publication” (11/17)
- 13) Climate and Society: Drowning Cities, Vanderbilt University, Nashville, TN, (2 lectures, *Fall 2020*)- “Climate Gentrification” (11/16), “Climate and Migration in Bangladesh” (10/19)
- 14) 6<sup>th</sup> Grade Science Class, Templeton Academy, Nashville, TN, *Spring 2020*- “Introduction to climate change” (1/23)
- 15) Climate Change and the Global Response: A Multi-Disciplinary Perspective, Vanderbilt University, Nashville, TN, *Fall 2019*- “What is climate justice?” (10/16)
- 16) Global Climate Change, Vanderbilt University, Nashville, TN (3 lectures, *Fall 2018*)-

“Greenhouse Effect” (8/27), “Greenhouse Gases” (8/29), “How Will Climate Change Effect Our Lives?” (10/8)

### **Other**

- Graduate Mentor, Leadership Alliance Summer Research - Early Identification Program (SR-EIP), Vanderbilt University, Nashville, TN (*June 2019 – August 2019*)
- Volunteer Teacher, One Heart Source, Ndagaa, Zanzibar (*June 2013*)
- Math and Science Tutor, Princeton Tutors, Princeton, NJ (*2013-2015*)

### **PROFESSIONAL DEVELOPMENT ACTIVITIES AND SERVICE**

- Faculty Board Member at Large, American Association of Geographers (AAG) Human Dimensions of Global Change (HDGC) subgroup (*2023-2025 term*)
  - Awards Subcommittee Co-Lead: 2024
- Treasurer and Secretary, Society for Risk Analysis (SRA) Justice, Equity and Risk Specialty Group (JERSG) (*2023-2024 term*)
- U.S. Department of Energy (DOE) Grant Review Panelist (Spring 2024)
- ASEE DELTA Junior Faculty Institute (April 2024)
- Consultant for the U.S. Department of State, June 2023
- Consultant for Earth Justice, 2022-2023
- Review Editor, *Frontiers in Climate- Climate Mobility* (*April 2022 – present*)
- Merit reviewer and panelist, NSF Small Business Innovation Research (SBIR) (2023)
- Merit reviewer and panelist, NSF EPSCoR Program (2023, 2024)
- Merit review and panelist, NSF DRRG Program (2022)
- Review journal manuscripts for *Nature Climate Change* (*February 2024*), *Frontiers in Climate Mobility* (*January 2024*), *Frontiers in Energy Research* (*December 2023*), *Natural Hazards* (*November 2023*), *Frontiers in Human Dynamics* (*December 2023, November 2023*), *Journal of Immigrant and Refugee Studies* (*October 2023*), *Cities* (*October 2023*), *PNAS* (*April 2023*), *Climatic Change* (*January 2024, April 2023*), *Journal of Population and Sustainability* (*February 2023*), *Nature Communications* (*December 2022*), *Scientific Reports* (*November 2022*), *Risk Analysis* (*November 2022, May 2023*), *Journal of Infrastructure Systems* (*November 2022*), *Population and Environment* (*March 2023, November 2022*), *Land Use Policy* (*October 2021*)
- Winter Simulation Conference 2021, Session Chair (*December 2021*)
- Earth Educators’ Rendezvous Preparing for an Academic Career (*July 2021*)
- Vanderbilt Institute for Energy and the Environment (VIEE) (*August 2017 – June 2021*), graduate student member
- Women in Data Science (WiDS) Ambassador (*Spring 2021*)
- Organized “Women in Data Science (WiDS) Raleigh and Nashville: Data Science in Coupled Human and Natural Systems” event, April 22, 2021
- Gobeshona Global Conference (*January 2021*), attendee
- U.S. Department of State Critical Language Scholarship virtual institute in Bangla (*September – November 2020*)
- ESSA-BEHAVE Summer School 2020, Behave Lab and European Social Simulation Association (ESSA), Advanced course on “Agent-Based Modelling for Social Scientists”, virtual, (*September 2020*)
- Fair Play Anti-Racism Workshop (*August 2020*)

- Regression Modeling Short Course with Frank Harrell, Nashville, TN (*May 2020*)
- Mental Health Awareness & Prevention of Suicide training (*April 2020*)
- UN Climate Change Conference, Madrid, Spain (*December 2019*)
- 17<sup>th</sup> Development and Climate Days at COP25, Madrid, Spain (*December 2019*)
- Graduate Student Workshop on Socio-Environmental Synthesis: Interdisciplinary Skill Building, Proposal Writing and Collaborating (by application), SESYNC, Annapolis, MD (*August 2019*)
- Collaborative Teamwork Workshop with Kei Koizumi (by invitation), Vanderbilt University (*March 2019*)
- AAAS DoSER Science Communication and Engagement with Religious Audiences Workshop, Vanderbilt University (*March 2019*)
- Women in Mathematics and Public Policy workshop (by application), University of California, Los Angeles (*January 2019*)
- Federal STEM Policy Workshop (by application), Washington, D.C. (*October 2018*)
- Data Visualization Workshop with Alberto Cairo (by application), Vanderbilt University (*September 2018*)
- Certificate in College Teaching, Center for Teaching, Vanderbilt University (*Fall 2018 – present*)
- Diversity Symposium to Support Career Development of Women and Minorities in STEM, Vanderbilt University (*August 2018*)
- Organizer, VISOR Workshop on Data in Gentrification and Equitable Development, Vanderbilt University (*April 2017*)

### **INSTITUTIONAL SERVICE AND LEADERSHIP**

- Vice President, Association for Women Geoscientists Vanderbilt Chapter (*December 2020 – May 2022*)
  - Pod leader, Vanderbilt AWG Unlearning Racism in the Geosciences (URGE) (*January 2021 – May 2021*)
- Department Representative, Graduate Student Council, Vanderbilt University (*August 2020 – August 2021*)
- Secretary, Earth and Environmental Science Graduate Student Association (*August 2020 – August 2021*)
- Graduate Student Representative, Department Diversity, Equity, and Inclusion Committee, Earth and Environmental Sciences, Vanderbilt University (*August 2020 – August 2021*)
- President, Graduate Student Council, Vanderbilt University (*July 2019 – August 2020*)
  - 2020 Winner of Vanderbilt Award for Leadership Excellence (VALE) Best Health and Wellness Program for Mental Health Bill of Rights and Responsibilities
  - Successfully advocated for Graduate Student and Post-doc Poster Printing and Dependent Care Travel Grants
  - Implemented improvements to University Grievance Procedure in Student Handbook
  - Led navigation of graduate student issues related to COVID-19 pandemic

- Council member, Vanderbilt University Sustainability Advisory Council (*January 2019 – Fall 2020*)
- Council member, Provost’s Council for Women’s Advancement and Equity, Vanderbilt University (*August 2019 – August 2020*)
- Council member, University Diversity Council, Vanderbilt University (*August 2019 – August 2020*)
- Council member, Graduate Leadership Development Institute, Advisory Committee (*January 2019 – August 2020*)
- Academic Chair, Earth and Environmental Science Graduate Student Association (*August 2019 – August 2020*)
- Member, University 2019-2020 Academic Calendar Committee, Vanderbilt University (*August 2019 – August 2020*)
- Graduate Student Representative, Chancellor Search Advisory Committee, Vanderbilt University, (*May – September 2019*)
- Student Life Liaison, Graduate Student Council, Vanderbilt University (*July 2018- July 2019*)
  - Finalized University Mental Health Bill of Rights and Responsibilities (featured in *Nature* and *Inside Higher Ed*)
  - Advocated for Graduate Student Hardship Fund
- Seminar Committee Representative, Department of Earth and Environmental Science, Vanderbilt University (*2018- Spring 2020*)
- Graduate Honor Council volunteer councilmember (*April 2019, June 2020, December 2020*)
- Department Recruiter, Organized trip and attended National Association of Black Geosciences Conference for first time with department for diversity recruiting, National Association of Black Geoscientists Annual Meeting, Houston, TX (*September 2018*)
- Co-Founder, Earth and Environmental Science Diversity Committee, Vanderbilt University (*2017-2019*)
- Group leader, Department strategy for inclusive recruitment, Graduate Diversity and Inclusion Committee, Vanderbilt University (*2017-2019*)
- Member, Association for Women Geoscientists Vanderbilt Chapter, Vanderbilt University (*2017-present*)
- Member, New Faculty Search Graduate Student Committee, Vanderbilt University (*Spring 2018*)

### **PROFESSIONAL EXPERIENCE**

Stop Slavery Analyst: Thomson Reuters Foundation Trust Conference (2017-2018)

- Volunteer analyst for Trust Conference Stop Slavery Awards, which recognizes companies striving to eradicate forced labor in their supply chains. Reviewed, ranked, and summarized company applications for Judging Board.

Sustainability Associate: ExxonMobil Global Sustainable Procurement, Houston, TX (August 2015-2017)

- Designed and implemented environmental performance program in the supply chain to enhance supply chain sustainability.

- Served as environmental advisor for upcoming Procurement bids as well as Fuels and Lubricants and Chemical Company projects.
  - Communications lead of cross-functional Houston Campus Sustainability Team to engage and educate employees on sustainability issues including recycling, waste reduction, paper reduction, and wildlife.
  - Led communications for first and second ExxonMobil Houston Earth Days.
- Procurement Intern: ExxonMobil Global Services, Fairfax, VA (Summer 2014)
- Conducted a drum reconditioning study to enhance sustainability of Fuels and Lubricants packaging at Lube Oil Blending Plants in the US.

### **OUTREACH AND COMMUNITY SERVICE**

- Pen Pals with a Purpose mentor, Metro Nashville Public Schools, Nashville, TN, *August 2018- August 2020*
- Project advisor, Middle School Water Project, Harpeth Hall School, Nashville, TN, *January 2020*
- Event coordinator, “Caring for Creation: A discussion of climate change, religion, and a sustainable future”, Nashville, TN, *August 2019*
- Expert judge, Middle School Water Project, Harpeth Hall School, Nashville, TN, *January 2019*
- Assistant facilitator, STEM Consortium: Reinforcing our unbreakable commitment to girls in STEM, Harpeth Hall School, Nashville, TN, *November 2018*
- Volunteer scientist, Vanderbilt SAVY Hydrology Camp for first grade students, Vanderbilt University, Nashville, TN, *October 2018*
- Mentor lunch, Harpeth Hall STEM Camp, Harpeth Hall School, Nashville, TN, *June 2018*
- Student mentor, Glencliff Girls STEM Day, Vanderbilt University, Nashville, TN, *March 2018*
- Visiting scientist to discuss responsible resource use with second grade class, A.Z. Kelley Elementary School, Antioch, TN, *January 2018*

### **PROFESSIONAL AFFILIATIONS**

- Society for Risk Analysis (SRA)
- Population Association of America (PAA)
- American Association of Geographers (AAG)
- Association for Women Geoscientists (AWG)

### **SKILLS AND LANGUAGES**

- Coding in R, Python, NetLogo, ArcGIS, QGIS
- Intermediate High in Bangla language, American Council on the Teaching of Foreign Languages Oral Proficiency Interview (OPI)

### **PROFESSIONAL REFERENCES**

Deb Niemeier , Clark Distinguished Chair Professor, Department of Civil and Environmental Engineering, Director of Center for Disaster Resilience, University of Maryland, College Park, [niemeier@umd.edu](mailto:niemeier@umd.edu)

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