
Urmila Basu Mallick

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EDUCATION

Yale University 2023-Present New Haven, CT
School of the Environment, *PhD*
Advisors: Dr. Mark Bradford, Dr. Oswald Schmitz

Yale University 2021-2023 New Haven, CT
School of the Environment, *Master of Environmental Science*
Advisor: Dr. Oswald Schmitz

Worcester Polytechnic Institute (WPI) 2017- 2021 Worcester, MA
Biology and Biotechnology, *Bachelor of Science*
Environmental & Sustainability Studies, *Bachelor of Arts*
Social Entrepreneurship, *Minor*
Advisor: Dr. Marja Bakermans

FELLOWSHIPS, AWARDS & GRANTS (Total = \$249,000)

NSF Graduate Research Fellowship (Pre-doctoral) , National Science Foundation (2021-2026)	\$138,000
Yale Tropical Resources Institute Endowment Fellowship , Yale University (2023-2024)	\$8000
Yale Tropical Resources Institute Endowment Fellowship , Yale University (2022-2023)	\$8000
Yale Institute for Biospheric Studies Early Grant , Yale University (2022-2023)	\$3500
Yale Institute for Biospheric Studies Research Matching Funds , Yale University (2022-2023)	\$500
David T. Schiff Fund for Wildlife, Habitat, and Biodiversity Research , Yale University (2022)	\$4000
NSF Research Experience for Undergraduates (REU) Fellow , Harvard University (2020)	\$6000
Women's Young Investigator Fellowship , Worcester Polytechnic Institute (2019-2020)	\$1000
Worcester Polytechnic Institute Merit Scholarship , Worcester Polytechnic Institute (2015)	\$80,000
Provost's (1st place) Major Qualifying Project Award in Dept. of Biology and Biotechnology , WPI	
Dean's List; Graduation with High Distinction , WPI	

RESEARCH EXPERIENCE

NSF Graduate Research Fellow, PhD Student New Haven, CT
Yale School of the Environment Aug 2023- Present

- Research on the impacts of livestock, large-bodied herbivores, and animal functional guilds on plant-mycorrhizal dynamics and ecosystem carbon balance, in tropical and boreal ecosystems

NSF Graduate Research Fellow, Master's Student (PI: Dr. Oswald Schmitz) Maun, Botswana
Yale School of the Environment, Okavango Research Institute (University of Botswana) Sep 2021- May 2023

- Explored the impacts of wildlife, livestock, species functional types, and human activity on soil carbon and soil health in Botswana's Makgadikgadi National Park and bordering livestock rangelands

- Graduate Research Assistant (PI: Dr. Simon Queenborough)** New Haven, CT
Yale School of the Environment Jan 2023- Present
- Analyzing long-term data from a montane tropical rain forest in northeastern Puerto Rico (Luquillo Forest Dynamics Plot), exploring the effect of hurricanes on biotic and abiotic drivers of *Heliconia caribaea* distribution and population dynamics across plots
- Graduate Research Assistant (PI: Dr. Oswald Schmitz)** Newfoundland, Canada
Yale School of the Environment, Memorial University of Newfoundland June - July 2023
- Field assistant in Terra Nova National Park (Newfoundland), exploring the impacts of moose management on boreal forest soil carbon storage
 - Established sites, conducted soil sampling, and surveyed vegetation
- Graduate Research Assistant (PI: Dr. James Saiers)** New Haven, CT
Yale School of the Environment March - May 2023
- Lab assistant for enhanced mineral weathering natural carbon capture project; Soil and vegetation sample processing and soil carbon analyses
- Graduate Research Assistant (PI: Dr. Oswald Schmitz)** New Haven, CT
Yale School of the Environment Sep 2022- Dec 2023
- Assisted NSF postdoc with soil sample processing and laboratory analyses for natural carbon capture project exploring the impacts of moose management on boreal forest soil carbon storage
- Graduate Research Assistant (PI: Prof. Anna Behm Masozera)** New Haven, CT
Yale School of the Environment Jan - Aug 2022
- Manuscript conceptualization, writing, and collaboration with co-authors for publication on international collaboration in Central African mountain gorilla conservation
- Graduate Research Assistant (PI: Dr. Oswald Schmitz)** New Haven, CT
Yale School of the Environment Sep 2021- May 2022
- Assisted PhD student and postdoc with soil sampling, processing, and laboratory analyses
- NSF Research Experience for Undergraduates (REU); Visiting Undergraduate** Cambridge, MA
Harvard University (PI: Dr. Colleen Cavanaugh, Dept. of Organismic & Evolutionary Biology) May '20-Aug '21
- Participated in a Leadership Alliance REU, hosted by Harvard's Summer Research-Early Identification Program; Participated in professional development events with faculty, doctoral students, and postdoctoral fellows from Harvard University and Brown University's Leadership Alliance
 - Explored bacterial symbiosis in the human oral microbiome: used metagenomics and metatranscriptomics to study the ecology of *Actinomyces* and TM7 in healthy and diseased bacterial genomes/transcriptomes
 - Continued research as Visiting Undergraduate at Harvard University (August 2020-2021)
- Interactive Qualifying Project (Advisor: Dr. Khalid Saeed)** Worcester, MA
Worcester Polytechnic Institute, Dept. of Social Science & Policy Studies Apr 2020- 2021
- Developed a system dynamics model and gaming environment for cost-benefit analysis of conventional free-ranging dog population management strategies versus a proposed social integration policy

Major Qualifying Project (Advisors: Dr. Marja Bakermans and Dr. Khalid Saeed) Worcester, MA
Worcester Polytechnic Institute; Depts: Biology & Biotechnology, Social Science & Policy May 2019-Oct '20

- Independently structured undergraduate thesis: Social integration feasibility of free-ranging dogs (FRD) for animal welfare, public health, and conservation benefits
- Assessed local/national Indian perspectives, FRD welfare, FRD threats on conservation efforts, and human-FRD interactions through interviews with professionals, an extensive literature review, and multivariate analyses of field data from Kolkata, India

Research Volunteer (PI: Dr. Guangping Gao) Worcester, MA
Horaë Gene Therapy Center, UMass Medical School Oct 2014-May 2016

- Assisted in adeno-associated virus development for Canavan disease gene therapy
- Laboratory skill development (e.g., PCR, gel electrophoresis, western blot, mouse handling/testing)

PUBLICATIONS

- **Mallick, U.B.**, Bakermans, M.H., Saeed, K. 2021. Transforming a Liability into an Asset: A System Dynamics Model for Free-Ranging Dog Population Management. *Systems* 9(56) doi: 10.3390/systems9030056
- *In preparation:* **Mallick, U.B.**, Orrick, K., Masunga, G., Schmitz, O.J. Differentiating the Impacts of Animal Functional Types on Soil Carbon Storage across a Semi-arid Rangeland and Protected Area in Botswana.
- *In preparation:* **Mallick, U.B.** Matlaga, D. Bruna, E.M. Zimmerman, J.K. Uriarte, M. Queenborough, S. The importance of disturbance: hurricanes modify the biotic and abiotic drivers of herbaceous understory plant dynamics in a tropical rain forest.
- *In preparation:* Masozera, A.B., **Mallick, U.B.**, McVey, A., Ruzigandekwe, F., Teferi, T., Koliba, C., Sanford L., Martin, A. International Cooperation and Mountain Gorilla Conservation: Longitudinal Analysis to Inform Species Conservation Action Planning.
- *In preparation:* **Mallick, U.B.** Utter, D.R., Cavanaugh, C.M. Saccharibacteria express the Arginine Deiminase System consistently across Health and Periodontal Disease.

PRESENTATIONS

- **Mallick, U.B.**, Orrick, K., Masunga, G., Schmitz, O.J. “Animal-mediated soil carbon storage across a semi-arid rangeland and protected area in Botswana.” *Poster*. American Geophysical Union: Annual Meeting 2023, San Francisco, CA. December 2023.
- **Mallick, U.B.**, Matlaga, D., Bruna, E.M., Zimmerman, J., Uriarte, M., Queenborough, S. “The importance of disturbance: hurricanes as controls on biotic and abiotic drivers of herbaceous understory plant dynamics in a tropical rain forest.” *Oral Presentation*. 11th International BIOGEMON Symposium on Ecosystem Behavior, San Juan, Puerto Rico. January 2024.
- **Mallick, U.B.** “Animal-mediated soil carbon storage across a semi-arid rangeland and protected area in Botswana.” *Oral Presentation*. Confluence Research Discussion Series, Yale School of the Environment, New Haven, CT. April 2023.
- **Mallick, U.B.** “Animal-mediated soil carbon storage across a semi-arid rangeland and protected area in Botswana.” *Oral Presentation*. Tropical Research Institute Symposium, Yale School of the Environment, New Haven, CT. April 2023.

- **Mallick, U.B.** “Animal-mediated soil carbon storage across a semi-arid rangeland and protected area in Botswana.” *Oral Presentation*. YSE Research Day, Yale School of the Environment, New Haven, CT. April 2023.
- **Mallick, U.B.,** Utter, D.R., Cavanaugh, C.M. “Bacterial symbiosis in the human oral microbiome: combining metagenomics and transcriptomics to identify the ecology of TM7x in health and disease.” *Oral Presentation*. 5th Annual Leadership Alliance National Symposium (online). August 2020.
- **Mallick, U.B.,** Utter, D.R., Cavanaugh, C.M. “Bacterial symbiosis in the human oral microbiome: combining metagenomics and transcriptomics to identify the ecology of TM7x in health and disease.” *Oral Presentation*. E3 and MCO Summer Research Opportunities at Harvard Joint Symposium, Harvard University (online). July 2020.
- **Mallick, U.B.,** Bakermans, M., Saeed, K. “Modeling social integration feasibility of free-ranging dogs: a population management intervention for conservation benefits”. *Poster*. Society for Conservation Biology: North American Congress for Conservation Biology (online). July 2020.
- **Mallick, U.B.,** Bakermans, M. “Social integration feasibility of free-ranging dogs: exploring stories and experiences.” *Oral Presentation*. 13th Annual Association for Environmental Studies and Sciences Conference (online). June 2021.
- **Mallick, U.B.** “Modeling social integration feasibility of free-ranging dogs for animal welfare, public health and conservation benefits.” *Oral Presentation*. Women’s Young Investigator Fellowship Symposium, Worcester Polytechnic Institute, MA. April 2020.

SKILLS

- **Statistical/Spatial/Software:** IRGA, ENVI, ESRI ArcGIS Pro, RStudio, Bash (Unix), Stella Architect, Vensim, Anvi’o, Litmaps, Data management and visualization
- **Field/Technical skills and Instruments:** Field experience in Botswana, Newfoundland, and India; Soil sampling/processing; Soil analyses: pH, total and inorganic carbon, texture by hydrometer, moisture; ELTRA C/S elemental analyzer (ELEMENTRAC CS-i); Avian banding; Cell culture; DNA/protein purification, Agarose gel electrophoresis, Western blot
- **Other:** Qualitative interviews; Research and grant writing
- **Languages:** Bengali (fluent), Hindi (advanced), French (elementary), Oriya (elementary)

TEACHING & MENTORSHIP

Mentor for National Science Foundation REU Student (PI: Dr. Marja Bakermans) Worcester, MA
Worcester Polytechnic Institute Jun-Aug 2021

- Mentored undergraduate REU student studying the effects of wind farms on bird population dynamics and habitat availability in the US

Teaching Assistant Worcester, MA
Worcester Polytechnic Institute Oct 2018-May 2021

- Employed for eight courses over five semesters, in: Biodiversity, Chemistry, and System Dynamics (Depts.: Biology and Biotechnology, Chemistry and Biochemistry, and Social Science and Policy Studies)
- Assisted professors with course management, laboratory supervision, project guidance, student office hours, and assignment/exam grading in laboratory and online environments

ACTIVITIES

Volunteer, Research Request Network New Haven, CT
Yale Prison Education Initiative Nov 2023- Present

Community infrastructure development project Maun, Botswana
Collaborator: Mr. Dikatholo Kedikilwe (Round River Botswana Trust) Aug 2022- Present

- Procuring funding to establish a system of solar-powered streetlights for main roads across 4 villages in the Okavango Delta, an area with no access to powerlines and a long history of human-wildlife conflict

Volunteer New Haven, CT
Yale School of the Environment Semester of Service Oct – Dec 2022

Fundraising and education volunteer Worcester, MA
Canines for Disabled Kids Jan- Dec 2021

Peer Learning Mentor for undergraduates Worcester, MA
Worcester Polytechnic Institute Oct 2020- May 2021

PROFESSIONAL AFFILIATIONS

American Geophysical Union 2023- Present

Society for Conservation Biology 2020- Present

Ecological Society of America 2020- Present

OTHER

Odissi Dancer (Soloist, Teacher, and Choreographer) New York City, Boston
Independent 2020-Present

- Collaborator, workshop instructor, and teacher in Boston and the New York metropolitan area

Ensemble Member US/UK/India/Sri Lanka/Canada
Nrityagram Dance Ensemble 2014-2020

- 6 international tours (Lincoln Center, Metropolitan Museum, Royal Festival Hall)
- Conducted over 50 workshops and classes at universities/venues in the US, India, and Canada
- Trained local village children, city classes, and ensemble members at Nrityagram (India) (2011-2020)
- Lead dancer for 2019 production: *Abuti*