

# Samantha Roth

samantha.m.roth@dartmouth.edu | <https://samantha-roth.github.io/>

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## RESEARCH EXPERIENCE:

Postdoctoral Research Associate, Thayer School of Engineering at Dartmouth College	2024-Present
Graduate Research Assistant, The Pennsylvania State University Department of Statistics	2022-2024
Maryland Sea Grant REU Intern, University of Maryland Center for Environmental Science	2018

## EDUCATION:

The Pennsylvania State University: State College, PA Doctor of Philosophy in Statistics Advisor: Murali Haran, Co-Advisor: Klaus Keller	2019-2024
Lehigh University: Bethlehem, PA Bachelor of Science in Statistics, with Highest Honors	2015-2019 Cumulative GPA: 3.82

## HONORS AND AWARDS:

2024: ASA ENVR Workshop Travel Award  
2024: SIAM Conference on Uncertainty Quantification Travel Award  
2023-2024: Jack and Eleanor Pettit Scholarship in Science  
2022-2023: J. Keith Ord Scholarship for Research in Spatial and Environmental Statistics  
2019- 2024: Janet L. Norwood Science Achievement Graduate Fellowship in Statistics  
2019- 2021: Institute for Computation and Data Science Scholarship  
2019: Verne M. Willaman Distinguished Graduate Fellowship in the Eberly College of Science

## RESEARCH INTERESTS:

Computer model calibration, uncertainty quantification, statistical downscaling, environmental statistics, spatial/spatiotemporal statistics, climate science, high performance computing

## PUBLICATIONS:

**Roth, S.M.**, Lee, B.S., Nicholas, R.E., Keller, K., & Haran, M. (2024) Bayesian spatial models for projecting corn yields. *Remote Sensing*. 16(1): 69. <https://doi.org/10.3390/rs16010069>.

**Roth, S. M.**, Lee, B. S., Sharma, S., Hosseini-Shakib, I., Keller, K., & Haran, M. (2023). Flood hazard model calibration using multiresolution model output. *Environmetrics*, 34(2): e2769. <https://doi.org/10.1002/env.2769>.

Ye, H., Nicholas, R.E., **Roth, S.M.**, & Keller, K. (2021). Considering uncertainties expands the lower tail of maize yield projections. *PLoS ONE* 16(11): e0259180. <https://doi.org/10.1371/journal.pone.0259180>.

## PAPERS UNDER REVIEW:

Pollack, A., Auermueller, L., Burleyson, C., Campbell, J.E., Condon, M., Cooper, C., Coronese, M., Dangendorf, S., Doss-Gollin, J., Hedge, P., Helgeson, C., Kopp, R., Kwakkel, J., Leaf, A., Lesk, C., Mankin, J., Mayfield, E., Nicholas, R.E., Rice, J., **Roth, S.M.**, Scheeler, M., Srikrishnan, V., Tuana, N., Vernon, C., Zhao, M., & Keller, K. (2024) Investing in open and fair practices for more usable and equitable climate-risk research. *Under review at PNAS*.

**Roth, S.M.**, Sharma, S., Alipour, A., Keller, K., & Haran, M. (2025) Probabilistic Flood Model Downscaling. *Under review at The Annals of Applied Statistics*. Pre-print available at <http://arxiv.org/abs/2503.20962>.

#### PAPERS IN IN PREPARATION:

Ruckert, K.L., Cooper, C., **Roth, S.M.**, and Nicholas, R.E. (TBA) Simpler Graph Types Improve Interpretation of Extreme Precipitation.

**Roth, S.M.**, Ye, H., Nicholas, R.E., Srikrishnan, V., and Keller, K. (TBA) Emulation methods and adaptive sampling increase the efficiency of sensitivity analysis for computationally expensive models.

#### PRESENTATIONS:

Probabilistic Downscaling for Flood Hazard Models

- Invited Talk, American Geophysical Union Fall Meeting, Washington, DC, USA, 2024
- Poster, ASA ENVR Workshop: Spatial Data Science for the Environment, Boulder, CO, USA, 2024
- Talk, DOE's Earth and Environmental Systems Modeling Program PI Meeting, Rockville, MD, USA, 2024
- Invited Talk, SIAM Conference on Uncertainty Quantification 2024, Trieste, Italy, 2024

Statistically approximating a computationally demanding flood model

- Talk, Spatial Statistics 2023, Boulder, CO, USA, 2023

Flood hazard model calibration using multiresolution model output

- Poster, Penn State Climate Solutions Symposium, State College, PA, USA, 2023
- Poster, Rao Prize Conference at The Pennsylvania State University, State College, PA, USA, 2023
- Invited Talk, Muhlenberg College Department of Mathematics Colloquium, Allentown, PA, USA, 2023
- Poster, Institute for Computational and Data Sciences Symposium, State College, PA, USA, 2022
- Poster, American Geophysical Union Fall Meeting 2022, Chicago, IL, USA, 2022
- Talk, Joint Statistical Meetings, Washington, DC, USA, 2022
- Poster, World Meeting of The International Society for Bayesian Analysis, Montreal, QC, Canada, 2022

A Bayesian Spatial Model for Corn Yield

- Talk, Institute for Computational and Data Sciences Symposium, State College, PA, 2021

Predicting Regional Suitability for Zika Outbreaks: A Comparative Statistical Study

- Poster, Society for Mathematical Biology Annual Meeting, Montreal, QC, Canada, 2019

#### TEACHING EXPERIENCE:

*Guest Lecturer, Dartmouth College*

- ENGS.107-WI25: Bayesian Statistical Modeling and Computation, 2025

*Graduate Instructor, The Pennsylvania State University*

- STAT415: Introduction to Mathematical Statistics, 2023
- STAT200: Elementary Statistics, 2022

#### SERVICE:

- Flood Resilience Fest, Selinsgrove, PA, USA, 2022
- American Statistical Association Data Fest at Penn State, State College, PA, USA, 2022
- Undergraduate Women in Science Grad School 101 Panel, State College, PA, USA, 2023

#### EXTRACURRICULAR ACTIVITIES:

- *Treasurer, Institute for Computational and Data Sciences Student Group* 2022-2023
- *President, Institute for Computational and Data Sciences Student Group* 2021-2022
- *Treasurer, Statistics Graduate Student Association at The Pennsylvania State University* 2021-2022

SKILLS: Skilled with R, Stan, and ArcGIS; experience with Python and QGIS