Madeleine Burns

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Education

Dartmouth College (Hanover, NH) *Sep. 2025 – Present*
Ph.D. in Ecology, Evolution, Environment and Society (EEES) Program
- Climate Modeling and Impacts Group

Princeton University (Princeton, NJ) *Aug. 2020 – May 2024*
B.S.E. in Environmental Engineering
- Minor: Applications of Computing
- GPA: 3.93/4.0, *summa cum laude*

Durango High School (Durango, CO) *Aug. 2016 – May 2020*

Professional Experience

Scientists in Parks Intern *Remote*
National Park Service *Aug. 2024 – Aug. 2025*
- Conducted a climate change analysis of Redwood Creek in Muir Woods National Monument to predict future streamflow and evaluate impacts on vulnerable salmonid populations in the San Francisco Bay Area, and presented results to park staff.
- Facilitated development of a unified water balance and streamflow model for NPS use, including developing R scripts for model calibration, implementing novel statistical analyses and visualizations, writing user manuals, and transitioning project to GitHub.

Hydrology Intern *Lakewood, CO*
U.S. Bureau of Reclamation *May – Aug. 2023*
- Documented climate change analysis of the Central Valley Project, including analyzing data from the Coupled Model Intercomparison Project 5 (CMIP5), creating visualizations, and compiling information into a technical briefing for stakeholders.
- Maintained and expanded computational infrastructure for hydrologic operations and analysis, including calculating evaporation rates for incorporation into the CalSim 3 model and maintaining the Flood Operations Tool for Folsom Reservoir.
  - Debugged and updated code, improved testing workflow, and integrated development using GitLab and containerization.

Research Assistant *Seattle, WA*
University of Washington Department of Atmospheric Sciences *June – Aug. 2022*
- Analyzed data from Coupled Model Intercomparison Project 6 (CMIP6) climate models using Python and NCL to quantify and understand plant responses to increased CO2 concentrations.

Net Zero America Intern *Princeton, NJ*
Climate Central *May – Aug. 2021*
- Conducted research and analysis to understand the economic impacts of net zero carbon emission policies.
- Used R to analyze and visualize data from Princeton University's Net Zero America Project.

Tutor *Remote*
Ivy Bound *2021 - 2023*
- Virtually tutored multiple students in subjects ranging from SAT preparation to computer science, improving understanding and promoting mastery of the material.

Presentations

1. **Burns, M.C.**, B. Buchovecky, L.C. Hahn, C.M. Zarakas, K.C. Armour, and A.L.S. Swann. *Physiologically-Driven Albedo Feedback and Heat Transport Contributions to Arctic Warming.* 2023 American Meteorological Society Annual Meeting, *12 Jan. 2023.* (oral presentation)

Awards

- National Defense Science and Engineering Graduate (NDSEG) Fellowship (2025)
- NSF Graduate Research Fellowship (GRFP) (2025) - *declined*
- Princeton University Peter W. Stroh '51 Environmental Senior Thesis Prize (2024)
- Princeton University Christine Trmal Prize (2024)
- Sigma Xi Nomination (2024)
- Tau Beta Pi Nomination (2023, 2024)
- Princeton University Lewis Center for the Arts Outstanding Work by a Senior Award (2024)
- National Merit Scholar (2020)

Certifications

- Engineer Intern License (2024): Certified by the state of Colorado after passing the Fundamentals of Engineering (FE) Exam in Environmental Engineering.

Skills

- Strong background in computer science, especially scientific and research applications.
- Programming languages: Python, Java, Matlab, R, C, JavaScript, NCL
- Computing infrastructures: Git, Docker, High-Performance Computing (HPC)