Elle Weeks

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EDUCATION

Harvard University — Cambridge, MA
Ph.D. Applied Mathematics — Expected May 2026
Advisor: Dr. Eli Tziperman

Macalester College — Saint Paul, MN
B.A. Applied Mathematics and Statistics — May 2017
magna cum laude, Phi Beta Kappa

TEACHING EXPERIENCE

Harvard University, Department of Mathematics — Cambridge, MA
Teaching Fellow, Multivariable Calculus — Fall 2025

- Primary instructor for one section of XX students.
- Planned and delivered lectures 3 times per week engaging students with active learning strategies.

Harvard University, Department of Applied Mathematics — Cambridge, MA
Head Teaching Fellow, Nonlinear Dynamical Systems — Spring 2025

- Updated homework assignments and final project topics to include new applications.
- Guided 20 students through collaborative in-class activities in flipped classroom setting.
- Advised students on final research projects investigating applications of course material.

Teaching Fellow, Mathematical Modeling — Fall 2024

- Designed and led a weekly section guiding 8 students through coding applications of course material.
- Advised students on mid-term and final modeling projects.

Teaching Fellow, Introduction to Scientific Computing — Fall 2023

- Designed and taught a coding laboratory section.
- Guided 10 students through collaborative in-class activities in flipped classroom setting.
- Advised students on final research projects investigating applications of course material.

Head Teaching Fellow, Applied Linear Algebra and Big Data — Spring 2022, 2023

- Presented 4 lectures to classes of over 100 students covering principal component analysis, singular value decomposition, and various clustering methods.
- Managed 11 undergraduate teaching assistants, advising them on preparing solutions, grading homework and quizzes, and organizing weekly office hours.

Harvard University, Department of Earth and Planetary Sciences — Cambridge, MA
Head Teaching Fellow, Introduction to Physical Oceanography — Spring 2024

- Presented 2 lectures to a class of 23 students covering large-scale ocean circulation.
- Co-led a field trip to the Woods Hole Oceanographic Institution.
- Designed and led weekly section facilitating additional practice with course concepts.

Macalester College, Department of Mathematics, Statistics, and Computer Science Saint Paul, MN
Teaching Assistant, Differential Equations Spring 2017

- Coached students through collaborative in-class activities in flipped classroom setting.

Teaching Assistant, Applied Multivariable Calculus I & III Spring 2015 & 2016, Fall 2016

- Led office hour sections to students of diverse backgrounds and pursuing a range of different undergraduate majors.

Macalester College, Department of Chemistry
Supplementary Instruction Leader, General Chemistry II Spring 2016

- Designed and facilitated practice-based learning sections.

EDUCATIONAL DEVELOPMENT

Harvard University, School of Engineering and Applied Sciences (SEAS) Cambridge, MA
SEAS Teaching Practicum Spring 2023

- Semester-long workshop developing skills in planning and presenting lectures, incorporating active-learning techniques, designing and giving feedback on homework assignments.

STEM Pedagogy Hour Fall 2024

- Weekly reading group discussing *The ABC's of How We Learn* by Schwartz, Tsang, & Blair.

RESEARCH EXPERIENCE

Harvard University Cambridge, MA
Doctoral Researcher 2020-present
Project: Influences on the length and depth scales of coastal upwelling

- Designed realistic and idealized numerical modeling experiments of coastal upwelling using the MIT general circulation model.
- Proposed and tested scaling laws for width of the coastal upwelling zone and the depth from which upwelled water originates.
- Advised undergraduate research assistant on investigating and choosing wind data products to test in simulations.

Project: Models of the El Niño Southern Oscillation

- Discovered biases in existing fitting methods for the recharge oscillator model of ENSO.
- Proposed novel approach for fitting the recharge oscillator model to better control for structured noise in the data correcting for previously identified biases.

Broad Institute of MIT and Harvard Cambridge, MA
Associate Computational Biologist II 2017-2020

- Developed method for casual gene prioritization integrating genetic data about disease with molecular data about cell types and biological processes.
- Collaborated with multiple teams of researchers to apply method to specific disease studies and to extend method to leverage signals from multiple traits simultaneously.
- Advised by Drs. Hilary Finucane and Eric Lander.

Planned Parenthood Saint Paul, MN
Volunteer Statistical Consultant 2017

- Analyzed appointment data from 20 clinics in the Minnesota and Dakota regions for Planned Parenthood to increase efficient use of clinic time.

Macalester College Saint Paul, MN
Summer Undergraduate Research Assistant Summer 2015, 2016
Project: Dryland banded vegetation pattern formation
- Combined satellite imagery and remotely sensed elevation data to determine the relationships between vegetation patterning characteristics and regional topography.
- Developed methods for combining and de-noising remotely sensed data to measure topographical characteristics and identify vegetation features.
- Advised by Professor Chad Topaz.

Project: Graph signal processing
- Investigated methods for generating a multiresolution of graphs.
- Advised by Professors David Shuman and Andrew Beveridge.

LEADERSHIP AND SERVICE

Harvard University, Department of Earth and Planetary Sciences Cambridge, MA
Graduate Student Field Trip Co-Leader 2024
- Planned and led a group of 25 graduate students on an international trip to Nova Scotia collaboratively with 3 co-leaders.
- Developed a week-long curriculum focused on visited points of interests for students with a variety of backgrounds within the earth sciences.
- Facilitated community building exercises among new and returning graduate students.

Graduate Student Seminar Series Organizer 2023-2024
- Coordinated the graduate student seminar series with the goal of creating a supportive environment for discussing research and building community.

Macalester College Saint Paul, MN
Committee for Women in Mathematics, Statistics, and Computer Science Founder 2015-2017
- Facilitated community building among gender minorities in the MSCS department.
- Organized panels, discussions, and social events encouraging critical thinking and conversations about gender dynamics in the MSCS department and allied fields.

FELLOWSHIPS AND AWARDS

EPS Graduate Teaching Award, Harvard University 2024
Certificate of Distinction in Teaching, Harvard University 2022
Peirce Fellowship, Harvard University 2020-2023
Konhauser Award for Mathematical Achievement, Macalester College 2017
Undergraduate Statistics Research Project Competition Winner 2017
DeWitt Wallace Distinguished Scholarship, Macalester College 2013-2017

PUBLICATIONS

*Indicates undergraduate student co-author

E. M. Weeks, *S. Packman, and E. Tziperman. The effects of a spatially and temporally variable wind stress on the upwelling source depth in the California upwelling system. In prep.

E. M. Weeks and E. Tziperman. Challenges in determining if ENSO is a damped or a self-sustained oscillation. Under review at *Geophysical Research Letters.*

E. M. Weeks and E. Tziperman. Looking for scaling laws for the width and source depth of coastal upwelling zones. In press at *Journal of Physical Oceanography*.

M. Borreggine, … **E. M. Weeks**, et al. Combining paleocurrents and sea level in a least-cost pathway model of human dispersal from Sunda to Sahul, 65-45,000 years ago. Under review at *Quatenary Science Reviews*.

E. M. Weeks, M. Losch, and E. Tziperman. The upwelling source depth distribution and its response to wind stress and stratification. *Journal of Physical Oceanography*, 2024.

E. M. Weeks, J. C. Ulirsch, et al. Leveraging polygenic enrichments of gene features to predict genes underlying complex traits and diseases. *Nature Genetics*, 2023.

K. G. Aragam, … **E. M. Weeks**, et al. Discovery and systematic characterization of risk variants and genes for coronary artery disease in over a million participants. *Nature Genetics*, 2022.

J. Nasser, D. T. Bergman, C. P. Fulco, P. Guckelberger, B. R. Doughty, … **E.M. Weeks**, et al. Genome-wide enhancer maps link risk variants to disease genes. *Nature*, 2021.

PRESENTATIONS

Oral Presentations

E. M. Weeks and E. Tziperman, 2025. Is ENSO a damped or a self-sustained oscillation? Presented at the European Geosciences Union General Assembly, Vienna, Austria.

E. M. Weeks, M. Losch, and E. Tziperman, 2023. The upwelling source depth distribution and its response to wind stress and stratification. Presented at the American Geophysical Union Annual Meeting, San Francisco, CA.

E. M. Weeks, et al., 2019. Computational GWAS gene prioritization using local and polygenic signals. Invited talk at the Medical and Population Genetics Program Meeting, Broad Institute, Cambridge, MA.

E. M. Weeks, et al., 2019. Computational prioritization of genes with genome-wide enrichments. Invited talk at the Variant to Function Initiative Lab Meeting, Broad Institute, Cambridge, MA.

E. M. Weeks, J. C. Ulirsch, et al., 2018. Genome-wide priors for gene prioritization. Invited talk at the Stanley Center Program Meeting, Broad Institute, Cambridge, MA.

Poster Presentations

E. M. Weeks and E. Tziperman, 2024. Characterizing the width of the coastal upwelling zone. Presented at the Conference on Atmospheric and Oceanic Fluid Dynamics, Burlington, VT.

E. M. Weeks, M. Losch, and E. Tziperman, 2023. The effect of upwelling source depth on sea surface temperature in present and warmer climates. Presented at the Conference on Atmospheric and Oceanic Fluid Dynamics, Breckenridge, CO.

E. M. Weeks, J. C. Ulirsch, et al., 2019. Computational GWAS gene prioritization using local and polygenic signals. Presented at the American Society of Human Genetics Annual Meeting, Houston, TX.

E. M. Weeks, J. C. Ulirsch, et al., 2018. Genome-wide priors for gene prioritization. Presented at the American Society of Human Genetics Annual Meeting, San Diego, CA.

E. M. Weeks, J. Haack, J. Ramthun, D. Schmidt, et al., 2017. Nonlocal topography influences vegetation pattern wavelength in the Horn of Africa. Presented at the Joint Mathematics Meetings, Atlanta, GA.

E. M. Weeks, A. Archer, S. Faridani, Y. Jin, et al., 2016. Graph reduction methods for multiscale dictionary design. Presented at the Joint Mathematics Meetings, Seattle, WA.

TECHNICAL SKILLS

Programming: Python, MATLAB, R, Mathematica, Fortran90
Other applications: LaTeX, Linux/Unix, Git

OTHER INTERESTS

Running, biking, rock climbing, ceramics