

Lexi Arlen

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EDUCATION

Stanford University

Fourth Year Ph.D. Student in Earth System Science
Advisor: Earle Wilson

Stanford, CA
November 2025

Washington University

Bachelor of Arts, Mathematics
Bachelor of Arts, Geophysics
GPA: 3.86/4.00

St. Louis, MO
May 2022
May 2022

PUBLICATIONS

Arlen, L., Wilson, E. A., Dansereau, V., Lai, C. Y., Meng, Y. A simple bonded discrete element model for sea ice. (in prep)

Wilson, E. A., Arlen, L., Campbell, E. C. Recent extremes in Antarctic sea ice extent modulated by ocean heat ventilation. Proceedings of the National Academy of Sciences. (under review)

Nabelek, P., Arlen, A., Fromcke, T., 2023. On periodic and finite genus solutions to the integrable Kaup–Broer system for capillary waves. Applied Numerical Mathematics 199, 123-135.

RESEARCH EXPERIENCE

Stanford University, Earth System Science

Graduate Research Assistant, September 2022 – present

Stanford, CA

Advisor: Dr. Earle Wilson

- Develop discrete element model of sea ice breakup
- Contribute to weekly research meetings, attend department and school-wide seminars, and foster collaborations with Civil and Environmental Engineering, Geophysics, and Oceans Departments
- Give biannual talks for graduate student seminars in Civil and Environmental Engineering and Earth System Science

Oregon State University, Mathematics

Research Experience for Undergraduates (REU) Participant, June – August 2021

Corvallis, OR

Advisor: Dr. Patrik Nabelek; *additional mentorship from Dr. Solomon Yim*

- Produced one gap solutions to the Kaup-Broer system, a coupled system of nonlinear partial differential equations modeling shallow water waves.
- Studied the role of elliptic functions and Riemann surfaces in finding these solutions. Collaborated and presented at daily research meetings.
- Gave two research talks and wrote a final paper presenting findings.

FIELD EXPERIENCE

Stanford University, Earth System Science

Nome, AK

Research Scientist, June – July 2023

Principal Investigator: Dr. Kevin Arrigo

- Assisted sediment trap and multi-corer experiments aboard the R/V Sikuliaq on the 45-day ToTS Cruise to the Chukchi Sea.
- Designed and executed an experiment using drifting wave buoys to study the attenuation of ocean surface waves in the sea ice pack.
- Conducted drone surveys of the sea ice pack and implemented an image segmentation algorithm to extract sea ice floe size distributions from the UAV imagery.

Oregon State University, Earth, Ocean, and Atmospheric Sciences

Corvallis, OR

Field Volunteer, May – July 2021

Principal Investigators: Dr. Anne Tréhu, Dr. Emilie Hooft, Dr. Erin Wirth, Dr. Kevin Ward

- Took part in the deployment and recovery of 750 nodal seismometers throughout Oregon's Coastal Range to image the structure of the Cascadia Subduction Zone.
- Cleaned and formatted field notes.
- Launched a blog detailing the time spent in the field.

AWARDS

Best Student Poster Presentation at AMS 2025 Polar Meteorology and Oceanography Conference	\$100
McGee Levorson Grant (awarded 2023)	\$2,500
NSF Graduate Research Fellowship (awarded in 2022)	\$159,000
Travel award to present at the Gulf Coast Undergraduate Research Symposium 2021	
Washington University Dean's List (2018-2022)	

TEACHING AND MENTORING

Stanford University, Doerr School of Sustainability

Mentor for Sustainability, Engineering and Science Undergraduate Research, Summers 2023-2025

- Mentored a Stanford undergraduate on a 10-week summer research project:
 - Segmentation of synthetic aperture radar imagery to assess the influence of storms on the sea ice floe size distribution (2023).
 - Quantifying Antarctic sea ice variability from reanalysis datasets, passive microwave remote sensing, and idealized 1-dimensional modeling (2024).
 - Analyzing the influence of floe-floe collisions and fracturing on sea ice velocity fluctuations using an idealized discrete element model (2025).
- Met with students twice per week and supported the creation of a final poster and presentation.

Stanford University, Stanford Summer Pre-Collegiate Institute

Instructor for Climate Change: Projections and Uncertainty, Summer 2025

- Designed a course to introduce high school students to the Earth system, radiation, Earth's energy budget, and global climate models with Python based exercises.
- Taught two-hour lessons every day for two weeks plus one hour of office hours.
- Mentored small groups on a final project on the influence of climate change on a particular component of the Earth System.

Stanford University, Earth System Science Department

Graduate Assistant Instructor for ESS 248: Polar Climate Dynamics, Spring 2024

- Gave a lecture on sea ice dynamics.
- Lead weekly office hours.

- Graded homework assignments.

Washington University, The Center for Teaching and Learning

Matched Academic Mentor, April 2019 – May 2022

- Mentored one to three students in Calculus II once or twice per week for two hours.
- Facilitated small group learning through homework, practice problems, and test preparation.
- Promoted proper organizational, study, and note-taking skills.

Washington University, Department of Mathematics

Undergraduate Assistant Instructor for Calculus I and Calculus II, Spring 2022

- Lead two weekly discussion sections of 39 students to review content in a collaborative setting.
- Assisted students in the Math Help Room with their calculus and differential equations coursework.
- Proof-read quizzes and exams.

Washington University, Department of Mathematics

Undergraduate Assistant Instructor for Math 131; Fall 2020 and Fall 2021

- Lead two weekly discussion sections for 15 students to review new content in a collaborative setting.
- Assisted students in the Math Help Room with their calculus and differential equations coursework.
- Proof-read quizzes and exams.

Washington University, Department of Earth and Planetary Science

Undergraduate Assistant Instructor for EPSc 131: Natural Disasters, Spring 2021

- Monitored the chat box during lectures.
- Held a two-hour weekly office hour to answer questions on content and homework.
- Graded homework assignments and exams.

Diablo Gymnastics School

Head Coach, December 2015 – August 2018

- Taught classes of eight to nine children aged 3 to 12 for 10 hours per week.
- Designed lesson plans and drills to teach students the skills to advance to the next level.

PRESENTATIONS

Scale Aware Sea Ice Project (SASIP) Annual Meeting, Providence, RI, June 2025. “The Sensitivity of the Emergent Sea Ice Floe Size Distribution to Wind Stress and Ice Strength” (poster).

American Meteorological Society 18th Polar Meteorology and Oceanography Conference, Denver, CO, May 2025. “The Sensitivity of the Emergent Sea Ice Floe Size Distribution to Wind Stress and Ice Strength” (poster).

Ocean Sciences Meeting, New Orleans, LA, February 2024. “Observations of Ocean Surface Waves in the Chukchi Sea Marginal Ice Zone” (poster).

American Geophysical Union, San Francisco, CA, December 2023. “In Situ Observations of Summertime Surface Wave Propagation in the Chukchi Sea Marginal Ice Zone” (poster).

Graduate Climate Conference, Massachusetts Institute of Technology Woods Hole Oceanographic Institute, Woods Hole, MA, November 2023. “Observations of Ocean Surface Wave Propagation in the Chukchi Sea Marginal Ice Zone” (poster).

Gulf Coast Undergraduate Research Symposium, Rice University, Houston, TX, October 2021. “One-Gap Solutions to the Kaup-Broer System” (lecture).

OUTREACH

Sprout Up

Lead Instructor, November 2025

- Teach weekly one-hour lessons to first grade students on topics related to the Earth system

Stanford-SummitTahoma Expeditions Program (SSTEP)

Mentor, January 2024

- Designed a project on the data analysis of polar climatological datasets for a high school student I hosted for two weeks.

Science Small Groups

Mentor, Autumn 2024

- Mentored a small group of California community college students for one hour each week on research methodology and STEM careers.

Geokids

Instructor, Autumn 2024

- Facilitated stations for biweekly field trip activities for local second graders related to soils, minerals, and rocks.

SKILLS

Languages: Python, LAMMPS, LaTeX, Bash, Julia, MATLAB

Certifications: Wilderness First Responder, AIARE I, Remote Pilot Certificate, Rescue SCUBA Diver