

# Alaina Stockdill

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## Education

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### Ph.D. in Applied Mathematics

Expected: June 2027

*University of California, Davis*

*Advisor: Professor Fernanda Valdivinos*

### Master of Science in Applied Mathematics

December 2024

*University of California, Davis*

### Bachelor of Science in Mathematics *Summa Cum Laude*

December 2021

*Whitworth University*

**Relevant Coursework:** *Mathematical Methods in Population Biology, Mathematical Biology, Introduction to Data Science, Numerical Methods of Differential Equations, Big Data & High Statistical Computing*

## Research Experience

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### Graduate Researcher

July 2023 – Present

*Department of Environmental Science and Policy - University of California, Davis*

Incorporating organismal thermal physiology and thermal performance into a dynamic allometric food web model consisting of 106 non-linear ordinary differential equations to study the effects of climate change and thermal variability on community abundances.

### Graduate Research Intern

June 2024 – August 2024

*Tohoku University & University of California, Los Angeles*

Collaborated with an international team of graduate students to apply time series data analysis and anomaly detection techniques to evaluate current agricultural irrigation management methods and propose methods for automating and replicating current management strategies.

### Undergraduate Researcher

June 2021– June 2022

*Department of Mathematics -University of Wisconsin, La Crosse*

Quantified ecological states of the Upper Mississippi River System using topological data analysis on a large water quality data after performing a comparative study of missing data interpolation techniques. Statistical analysis for data interpolation were performed in R and the Mapper algorithm in Python were used for state identification.

### Undergraduate Researcher

June 2019 – July 2019

*Departments of Chemistry and Mathematics - Whitworth University*

Investigated and developed a method for quantifying molecular shape to indicate whether two molecules are similar enough to crystallize. Designed a program to calculate the overlapping volume of two molecules and collaborated with another student to implement it in C++.

## Publications

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Larson, D. M., Bungula, W., McKean, C., **Stockdill, A.**, Lee, A., Miller, F. F., & Davis, K. (2023). Quantifying ecosystem states and state transitions of the Upper Mississippi River System using topological data analysis. *PLOS Computational Biology*, 19(6), e1011147.

Larson, D. M., Bungula, W., Lee, A., **Stockdill, A.**, McKean, C., Miller, F. F., ... & Hlavacek, E. (2023). Reconstructing missing data by comparing interpolation techniques: Applications for long-term water quality data. *Limnology and Oceanography: Methods*.

Brandt, A. K., Boyle, D. J., Butler, J. P., Gillingham, A. R., Penner, S. E., Spaniol, J. M., ... & Wheeler, K. A. (2021). Molecular Recognition and Shape Studies of 3-and 4-Substituted Diarylamide Quasiracemates. *Crystals*, 11(12), 1596.

### **Presentations**

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*Interpolating missing data and comparing performance of common interpolation techniques from a 30-year water quality dataset* 2021  
Biomathematics & Ecology: Education and Research; Online

### **Guest Lectures**

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*Modeling the Impacts of Climate Change in a Chilean Marine Ecosystem* January 2024  
Mathematical Biology, Whitworth University

### **Teaching & Mentorship**

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**Teaching Assistant** September 2022 - Present  
*Department of Mathematics - University of California, Davis* Davis, CA

Courses: Mathematical Biology, Differential Equations, Calculus for Bioscience A, B, C

**Math Grader** September 2019 – December 2021  
*Department of Mathematics - Whitworth University* Spokane, WA

Courses: Calculus I, Calculus III, Linear Algebra, Differential Equations, Abstract Algebra I

**Peer Advisor and Teaching Assistant** Fall 2019, 2020  
*Department of Mathematics - Whitworth University* Spokane, WA

Courses: Freshman Seminar

### **Awards & Honors**

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**Jastro & Shields Research Award** 2023 - 2025  
*University of California, Davis*

**Eivind-Lange Chilean Life Sciences Fellowship** 2024  
*University of California, Davis*

**Summer Graduate Group in Applied Math Fellowship** 2023  
*University of California, Davis*

**Enhanced Talent Writing Scholarship** 2021  
*Whitworth University*

**John Carlson Math Scholars** 2021  
*Whitworth University*

### **Service & Outreach**

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**Lead Coordinator, UCD SIAM Student Chapter** 2025-Present  
*University of California, Davis*

<b>Co-Coordinator, UCD SIAM Student Chapter</b> <i>University of California, Davis</i>	2024-2025
<b>Student Representative, Graduate Student Collective</b> <i>University of California, Davis</i>	2023-2024
<b>Co-Coordinator, Gender Minorities in Mathematics</b> <i>University of California, Davis</i>	2023-2024
<b>Panelist, Undergraduate Career Seminars: <i>Internships and REUs &amp; Applying to Graduate School</i></b> <i>Whitworth University</i>	2022-2025

### **Conferences & Workshops Attended**

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<b>International Workshop on Food Web Dynamics and Global Upwelling Systems</b> <i>Stellenbosch University</i>	December 2025
<b>Integrative Food Webs</b> <i>Bodega Bay Marine Laboratory, University of California, Davis</i>	September 2025
<b>SMPB - Modeling and Theory in Population Biology</b> <i>National Institute for Theory and Mathematics in Biology, Chicago</i>	June 2025
<b>Valdovinos Lab &amp; Collaborators Workshop</b> <i>Bodega Bay Marine Laboratory, University of California, Davis</i>	September 2025
<b>AMS Joint Mathematics Meeting</b> <i>San Fransico, CA</i>	January 2024
<b>Dynamics Days</b> <i>University of California, Davis</i>	January 2024
<b>Graduate Group in Applied Math Mini-Conference</b> <i>University of California, Davis</i>	March 2023
<b>Graduate Research Opportunities for Women (GROW)</b> <i>University of Illinois, Chicago</i>	October 2021

### **Skills and Qualifications**

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**Programming:** C++, Python, R, SQL, MATLAB, Julia