

Margaret Bernish

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EDUCATION

Graduate School of Oceanography, University of Rhode Island, Narragansett

SEPTEMBER 2023 – PRESENT

PhD candidate in biological oceanography. Modeling the effects of iron limitation on the allocation of nutrients to essential cellular processes in phytoplankton. Implementing the Cell Flux Model of Phytoplankton on a global scale using transport matrix modeling. Corroborating model output with data collected from various incubation studies on phytoplankton cells from different size classes and ecological niches. Successfully defended dissertation proposal on February 4th, 2025.

School of the Earth, Ocean, and Environment, University of South Carolina, Columbia

AUGUST 2021 – MAY 2023

Master's student in marine science. Researched the role of various novel strains of marine fungi in biogeochemical cycling in salt marsh sediments and in the open ocean. Conducted functional genome annotation to identify genes used in fungal denitrification pathways and nitrous oxide production. Participated in regular outreach at the Riverbanks Zoo & Garden in Columbia, SC, educating the public on climate change and providing mentorship to local high school students interested in STEM fields. Successfully defended thesis, titled "Genomic Analysis of *Exophiala* sp. ETNP2018, a Marine Fungal Strain Isolated from an Oxygen Minimum Zone" on March 15th, 2023.

University of North Carolina, Chapel Hill — *Bachelor of Science*

AUGUST 2016 - MAY 2020

Quantitative Biology major with a minor in marine sciences.
Graduated in May 2020.

RESEARCH EXPERIENCE

University of North Carolina, Chapel Hill— Associate *Researcher*, *Taylor Lab*

AUGUST 2019 - JULY 2021

Used bio-inspired engineering to study the perception and navigation solutions that animals have evolved to survive. Utilized computer programming and modeling in the study of magnetic reception in animals and bio-inspired navigation. Modeled the magnetic field in the Atlantic Ocean on MATLAB and visualized it with simulated data. Co-authored a scientific research article titled "A bioinspired navigation strategy that uses magnetic signatures to navigate without GPS in a linearized northern Atlantic Ocean: a simulation study." (DOI: 10.1088/1748-3190/abe7cd)

AWARDS

Recipient of the SEOE Graduate Scholar Award in 2021.

Recipient of the Hill Internship Award for biological research in October 2017.

Dean's List for three semesters at The University of North Carolina at Chapel Hill.

Carolina Research Scholar designation on transcript for inquiry-driven research.

SKILLS

Programming and data analysis.

Data visualization.

Writing and communication.

COMPUTER SOFTWARE EXPERTISE

MATLAB, a scientific programming software.

Microsoft Excel, particularly its mathematical computation abilities.

Python, a high-level programming language.

Microsoft Office Suite

SQL, a tool for manipulating data in databases.

**University of North Carolina, Chapel Hill— *Research Assistant,*
*Marchetti Lab***

AUGUST 2017 - MAY 2020

Utilized physiological and molecular analysis to study iron and light limitation of Southern Ocean. Prepared environmental and culture samples to be sequenced with high-throughput sequencing technology. Executed techniques such as microscopy, RNA-seq TagSeq library preparation, cell counts, qPCR, trace metal clean technique, chemical reagent preparation, and DNA/RNA extractions. Gained valuable experience with linear regressions and data analysis.

FIELD EXPERIENCE

Northeast US Shelf, Long-Term Ecological Research, Cruise AR92.

AUGUST 14th-19th, 2025

Participated in LTER network cruise centered around understanding planktonic food web dynamics across the Northeast US Shelf in the North Atlantic Ocean. Assisting in phytoplankton sampling and incubations. Measuring phytoplankton fluorescence and conducting nutrient limitation experiments.

Northeast US Shelf, Long-Term Ecological Research, Cruise AE2426.

NOVEMBER 6th-11th, 2024

Participated in LTER network cruise centered around understanding planktonic food web dynamics across the Northeast US Shelf in the North Atlantic Ocean. Assisting in phytoplankton sampling and incubations. Deploying and recovering CTDs.

JOB EXPERIENCE

**University of Rhode Island Graduate Assistants United, South
Kingstown, Rhode Island— *President.***

SEPTEMBER 2024 - PRESENT

Responsible for informing and educating a bargaining unit of over 700 graduate assistants about their contractual rights and responsibilities. Brainstorming and executing events to involve graduate students from various departments and to promote camaraderie.

PUBLICATIONS

Moreno, C. M., **Bernish, M.K.**, Meyer, M. G., Li, Z., Waite, N., Cohen, N. R., ... & Marchetti, A. (2024). Molecular physiology of Antarctic diatom natural assemblages and bloom event reveal insights into strategies contributing to their ecological success. *Msystems*, 9(3), e01306-23.

Pizzuti, S.A., **Bernish, M.K.**, Harvey A., Tourangeau L., Shriver C., Kehl, C.E., and Taylor, B.K. (2022). Uncovering how animals use combinations of magnetic field properties to navigate: a computational approach. **Journal of Comparative Physiology A**. <https://doi.org/10.1007/s00359-021-01523-0>

Taylor, B.K., **Bernish, M.K.**, Pizzuti, S.A. and Kehl, C.E., (2021). A bioinspired navigation strategy that uses magnetic signatures to navigate without GPS in a linearized northern Atlantic Ocean: a simulation study. **Bioinspiration & Biomimetics**. <https://doi.org/10.1088/1748-3190/abe7cd>

CONFERENCE PRESENTATIONS

Bernish, Margaret K. (2025) Modeling the Coexistence of Two Marine

Picocyanobacteria Under Changing Nitrogen Availability. Xiamen Symposium on Marine Environmental Sciences, January 14th-17th, 2025, Xiamen, China. *(Oral presentation)*.

Bernish, Margaret K. (2024) Utilizing a Coarse-Grained Model to Link Dissolved Iron Concentrations and the Physiology of Phytoplankton. Ocean Sciences Meeting, January 18th-23rd, 2024, New Orleans, LA. *(Poster presentation)*.

Bernish, Margaret K. (2021) Surface and subsurface salinity variability during marine heatwaves along the East Coast of the United States. American Geophysical Union Fall Meeting, December 13th-17th, 2021, New Orleans, LA. *(Oral presentation)*.

Bernish, Margaret K., Pizutti, Susan (2020) Using magnetic signatures to navigate the North Atlantic, Southeast Regional Society for Integrative and Comparative Biology Meeting, November 14th, 2020. *(Virtual presentation)*.