

Alayna G. Mackiewicz

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Education

University of North Carolina at Chapel Hill, *PhD, Biology* Fall 2019-present
Ecology, Evolution, and Organismal Behavior Program Chapel Hill, NC
Advisor: [Dr. Kenneth Lohmann](#)

University of Minnesota Duluth, *BSc, Biology* Fall 2015-Fall 2018
Minor: Environmental Science Duluth, MN
Academic Honors: Dean's List Fall 2016-Fall 2018

Research Experience

Graduate Research

University of North Carolina at Chapel Hill Spring 2022-present
Chapel Hill, NC

- Loggerhead sea turtle (*Caretta caretta*) magnetoreception behavioral experiments
- Behavior and neural activation patterns of magnetoreception in poison frogs (*Dendrobates auratus*)

Marine Biological Laboratory Summer 2021 and 2022
Woods Hole, MA

- Behavior and neurophysiology of magnetic sensing in oyster toadfish (*Opsanus tau*)

The Institute of Marine Sciences Summer 2020 and Spring 2021
Morehead City, NC

- Effects of radiofrequency noise on Gulf flounder (*Paralichthys albiguttata*) geomagnetic orientation

Undergraduate Research

Marine Biological Laboratory Summer 2017 and 2018
Woods Hole, MA

- Localizing individual soniferous fish using passive acoustic monitoring
- Anthropogenic R/V sound disrupts oyster toadfish (*Opsanus tau*) vocalizations

University of Minnesota Duluth Spring 2017
Duluth, MN

- Determining hearing sensitivities and auditory thresholds of bigheaded (*Hypothalmichthys nobilis*) and silver carp (*H. molitrix*)

U.S. Geological Survey Upper Midwest Environmental Sciences Center Summer 2016
Lacrosse, WI

- Effects of motorboat sound on bigheaded (*Hypothalmichthys nobilis*) and silver carp (*H. molitrix*) behavior

Publications

^{*,w}Lohmann, K.J., Goforth, K.M., **Mackiewicz, A.G.**, Lim, D.S., Lohmann, C.M.F. (2022). Magnetic maps in animal navigation. *Journal of Comparative Physiology A. Neuroethology, Sensory, Neural, and Behavioral Physiology*.

- Mackiewicz, A.G.**, Putland, R.L., Mensinger, A.F. (2021). Effects of vessel sound on oyster toadfish *Opsanus tau* calling behavior. *Marine Ecological Progress Series* **662**, 115-124.
- Putland, R.L., **Mackiewicz, A.G.**, Mensinger, A.F. (2018). Localizing individual oyster toadfish, *Opsanus tau*, boatwhistles using passive acoustics. *Ecological Informatics* **48**, 60-68.

+; Editor's Choice Award for Best Paper 2023, Journal of Comparative Physiology A
 ψ; Reader's Choice Award for Best Paper 2024, Journal of Comparative Physiology A

Presentations

Presenting Author

- 2024 Effect of strong magnetic pulse on map sense of loggerhead sea turtles. The Society for Integrative and Comparative Biology Conference, Seattle, WA.
- 2023 Neural patterns of magnetoreception in poison frogs. ZooNav Seminar, Chapel Hill, NC.
- 2023 Magnetoreception: a sensory biology enigma. Neural Systems and Behavior Course, Duluth, MN.
- 2023 Effect of radiofrequency on geomagnetic sense of flounder. The Society for Integrative and Comparative Biology Conference, Austin, TX.
- 2022 Exploring the neurobiology of magnetoreception with Oyster toadfish (*Opsanus tau*). ZooNav Seminar, Chapel Hill, NC.
- 2022 The magnetic sense of Oyster toadfish (*Opsanus tau*). The Society for Integrative and Comparative Biology Conference, Phoenix, AZ.
- 2019 Effects of anthropogenic vessel sound on oyster toadfish (*Opsanus tau*). The Society for Integrative and Comparative Biology Conference, Phoenix, AZ.
- 2018 Localizing individual oyster toadfish, *Opsanus tau*, boatwhistles using passive acoustics. Undergraduate Research Opportunities Program Symposium, Duluth, MN.
- 2018 Using passive acoustics to determine the effect of abiotic and biotic sound on oyster toadfish (*Opsanus tau*) vocalizations. The Society for Integrative and Comparative Biology Conference, San Francisco, CA.
- 2017 Using passive acoustics to determine the effect of abiotic and biotic sound on oyster toadfish (*Opsanus tau*) vocalizations. Marine Biological Laboratory Undergraduate Symposium, Woods Hole, MA.
- 2017 Auditory sensitivity of invasive bighead (*Hypophthalmichthys nobilis*) and silver carp (*H. molitrix*). Undergraduate Research Opportunities Program Symposium, Duluth, MN.
- 2017 Long-term exposure of bighead (*Hypophthalmichthys nobilis*) and silver carp (*H. molitrix*) to broadband sound. National Council on Undergraduate Research, Memphis, TN.
- 2016 Long-term exposure of bighead (*Hypophthalmichthys nobilis*) and silver carp (*H. molitrix*) to broadband sound. Biology Undergraduate Research in Science and Technology Symposium, Duluth, MN.

Contributor

- 2024 Spontaneous magnetic orientation in poison frogs. The Society for Integrative and Comparative Biology Conference, Seattle, WA.
- 2020 Seasonal changes in male oyster toadfish's response to boatwhistle playbacks. The Society for Integrative and Comparative Biology Conference, Seattle, WA.
- 2020 Effects of anthropogenic sound on the communication space oyster toadfish (*Opsanus tau*). The Society for Integrative and Comparative Biology Conference, Seattle, WA.
- 2019 Long-term PAM to investigate temporal and anthropogenic effects on oyster toadfish (*Opsanus tau*) mating vocalizations. The Society for Integrative and Comparative Biology Conference, Seattle, WA.
- 2018 Using passive acoustics to localize vocalizing oyster toadfish (*Opsanus tau*). The Society for Integrative and Comparative Biology Conference, Seattle, WA.

Scholarships, Fellowships, and Awards

2024	The Graduate School Dissertation Completion Fellowship (\$22,000)
2023	Core Facility Advocacy Committee Voucher Award (\$9,300)
2023	P.E.O. Scholars Award (\$20,000)
2023	Graduate Tuition Incentive Scholarship
2023	Beta Beta Beta Biological Honor Society Teaching Assistant Award
2022	Sigma Xi Grants in Aid of Research (\$944)
2022	Lerner-Gray Memorial Fund of the American Museum of Natural History (\$2,700)
2022	Department of Biology Gilbert Travel Award (\$500)
2021	The Graduate School Summer Research Fellowship (\$5,000)
2020-2022	Forest Lake Area Community Scholarship Foundation Master Award (\$10,000 total)
2020-2023	The Henry Van Peters Wilson Memorial Fund for Marine Biology (\$6,875 total)
2020	National Science Foundation Graduate Research Fellowship Proposal Honorable Mention
2020	SciREN Coast, People's Choice Award for Best Lesson Plan
2019-2022	Charlotte Magnum Travel Grant
2019	Excellence in Academics and Research Award, University of Minnesota Duluth
2019	Best Student Competition Finalist for the Marlene Zuk Award
2018	Bio REU Conference Travel Grant (\$1,200)
2017	University of Minnesota Duluth Mowbry Scholarship (\$6,000)
2017	National Council on Undergraduate Research Conference Travel Grant (\$750)
2017	University of Minnesota Duluth Study Abroad Scholarship (\$750)
2017	Minnesota American Fisheries Society Scholarship (\$350)
2016	Biology Undergraduate Research in Science and Technology Fellowship (\$5,000)
2016-2018	Laverne Noyes Scholarship (\$7,000 total)
2016-2018	Earl Bester Scholarship (\$2,500)
2015-2018	University of Minnesota Duluth U Promise Scholarship (\$1,140)
2015-2016	University of Minnesota Duluth Iron Range Scholarship (\$1,000)
2015-2016	Phillip Budden Scholarship (\$900)
2015-2016	University of Minnesota Alliss Scholarship (\$1,000)
2015	Forest Lake Area Community Scholarship Foundation Undergraduate Award (\$3,500)

Teaching and Tutoring Experience

Graduate Teaching Fellow

Behavioral Neuroscience (BIOL 455)

Spring 2024

University of North Carolina at Chapel Hill

Chapel Hill, NC

- Instructor for half of the course with an active learning style structure for 35 students

Graduate Teaching Assistant

Biology of Marine Animals Lab (BIOL 475L)

Spring 2020-2022

Animal Behavior Lab (BIOL 278L)

Fall 2020-2022 and Spring 2023

General Biology Lab (BIOL 101L)

Fall 2019

Undergraduate Teaching Assistant

Field Studies in Marine Biology (BIOL 3761)

May 2019

Friday Harbor Labs

Friday Harbor, WA

General Biology II (BIOL 1012)

Spring and Fall 2018

University of Minnesota Duluth

Duluth, MN

Tutoring

Academic Support Program for Student Athletes

Fall 2019-Fall 2020

University of North Carolina at Chapel Hill

Chapel Hill, NC

- Tutor introductory biology and marine science courses

Kathryn A. Martin Library

Fall 2017-Spring 2018

University of Minnesota Duluth

Duluth, MN

- Tutored introduction to biology, cell biology, genetics, ecology, and evolution

Mentorship

Undergraduate

Catie Mooney (Fall 2020-Fall 2020)

Jessica Carter (Fall 2020-Spring 2021)

Abhinaya Perumbedu (Fall 2021)

Cate Park (Fall 2021-Spring 2023)

Larry Rivenbark (Fall 2021-Spring 2022)

Bailey Colson (Fall 2021-Spring 2022)

*,**Cassian Smyth (Fall 2021-present)

Claire Sullivan (Fall 2021- Spring 2024)

Kate Lewin (Fall 2021-Spring 2022)

Jillian Daly (Spring 2022)

Molly Herring (Spring 2022)

Jessie Zheng (Spring 2022)

Undergraduate (continued)

*Abby Trocinski (Spring 2022-Spring 2023)

Madison Shoales (Fall 2022)

Abby Glazener (Fall 2022-Spring 2024)

Alexi Callinicos (Spring 2023)

Scarlett Becker (Spring 2023-Spring 2024)

Ria Jain (Fall 2023- Spring 2024)

Eloise Maclean (Fall 2023-Spring 2024)

Stella Sherrill (Fall 2023-Spring 2024)

Jake Nahama (Fall 2023-Spring 2024)

*; Independent Research (BIOL395) or Honor's Thesis (BIOL495) Mentor

**; Summer Undergraduate Research Fellowship Mentor

Highschool

Rhianna Absher (Fall 2020-Spring 2021)

Ria Jain (Fall 2022-Spring 2023)

Marine Biological Laboratory REU Program

2018 Cohort

2021 Cohort

2022 Cohort

Trainings, Certifications, and Skills

Professional Training and Certifications

Gradescope Workshop

Spring 2024

University of North Carolina at Chapel Hill

Chapel Hill, NC

InstructSTEM

Spring 2024

- Evidence-based teaching program

College Science Teaching Course (BIOL 810)

Fall 2023

University of North Carolina at Chapel Hill

Chapel Hill, NC

Research Skills

Field Research Techniques

- Animal Collection and Care: long lining, gill netting, seine netting, trawling, fish trapping, tagging
- Species identification, sexing, dissection
- Proficient marine and freshwater animal husbandry skills
- Open water SCUBA certified
- R/V Cruises:
 - Various fishing boats: Institute of Marine Sciences, Morehead, City
 - R/V Gemma: Marine Biological Laboratory, Woods Hole, MA
 - R/V Hawere: Leigh Marine Laboratory, Leigh, NZ

Laboratory Techniques

- Immunohistochemistry: pS6 neural activation staining, tissue sample preparation and general staining, reagent and buffer preparation, cryostat sectioning
- Physiological: neurophysiology recordings, Auditory Evoked Potential recordings, Electroretinography recordings, various electrode fabrication and preparation
- Behavioral: magnetic coil system construction and use, acoustic and sound experiments
- Technical: sound mapping, passive acoustic monitoring

Quantitative Skills

- Computer Software: R Studio, DeepLab Cut, BORIS, ImageJ, Spike2, Raven Pro, SigmaPlot, LabChart, Microsoft Office Suite, Adobe Creative Cloud

Memberships and Committees

ComSciCon Triangle Workshop	2023
Safe Spaces Committee	2022-present
ZooNav Research and Scientific Group	2021-present
Science Communication and Writing Club	2021-2022
Biology Graduate Student Association Secretary	2021-2022
SciREN Coast Research Logistics Coordinator	2020-2021
Member of Biology Graduate Student Association	2019-present
Biology Student Representative for College Dean Search Committee	2018
Member of the Society of Integrative and Comparative Biology	2018-present
Student Representative for the Biology Department Collegiate Fee's Committee	2017-2018
Executive Council Member of the Biology Club	2017-2018
Vice President of the American Fisheries Society	2017-2018

Popular Press and Outreach

Popular Press

Community Scholarship Foundation Spotlight [Video](#)
Lakes Area TV

February 2023
Forest Lake, MN

Summer Research Fellow Spotlight Article University of North Carolina at Chapel Hill	June 2021 <i>Chapel Hill, NC</i>
Spotlight on Undergraduate Research Video University of Minnesota Duluth	March 2021 <i>Duluth, MN</i>
Biology Outreach Video University of North Carolina at Chapel Hill	January 2021 <i>Chapel Hill, NC</i>
Scientists, Teachers Connect at SciREN Article Coastal Review	March 2020
“Sound pollution decreases the chances of love for oyster toadfish” Article The Acoustical Society of America	November 2019
Lake Ecology Course Video University of Minnesota Duluth	March 2018 <i>Duluth, MN</i>
Evaluating Lake Superior’s Health in a Changing World Video Minnesota Sea Grant	June 2017
<i>Scientific and Educational Outreach</i> Career Exploration Day: Marine Biology and Research Scientist Forest Lake Areas High School	Spring 2024 <i>Forest Lake, MN</i>
Session leader for Career Exploration Day for grades 10-12 and talked about a career as a marine biologist and research scientist	
Reptile and Amphibian Day North Carolina Museum of Natural Sciences	Spring 2024 <i>Raleigh, NC</i>
SciREN Triangle Networking Event North Carolina Museum of Natural Sciences	Fall 2023 <i>Raleigh, NC</i>
Introductory Video Lesson Plan	
NSF REU Program Information Session North Carolina State University	Fall 2023 <i>Raleigh, NC</i>
Ran a workshop for the undergraduate students for members of the Marine Science Club on the National Science Foundation’s Research Experience for Undergraduates program providing information and application and CV tips	
WinSPIRE Lesson Plan Leader University of North Carolina at Chapel Hill	Summer 2023 <i>Chapel Hill, NC</i>
Ran a workshop for the high school students interested in pursuing STEM on how to choose a college major	
Neuroscience After School Science Program	Spring 2023 <i>Chapel Hill, NC</i>
Taught grades 7-9 graders about neuroscience	
NSF REU Program Information Session University of North Carolina at Chapel Hill	Fall 2022 and 2023 <i>Chapel Hill, NC</i>

- Ran a workshop for the undergraduate students within the Biology Department on the National Science Foundation's Research Experience for Undergraduates program providing information and application and CV tips

ENVISION Research Competition by WiSTEM

Spring 2022

- Judged high school science competition proposals

Editor at The Pipettepen

Fall 2021-Spring 2022

University of North Carolina at Chapel Hill

Chapel Hill, NC

- [The Strange Case of the "First Exoplanet"](#)
- [Horror Movie or healthcare Advancement? Glowing Spider Silk Sutures Detect Infections](#)

Science Twitter Workshop

Summer 2021 and 2022

Marine Biological Laboratory

Woods Hole, MA

- Ran a workshop for the undergraduate students on the professional and academic use of Science Twitter and best practices for science communication in the age of social media

St. Timothy's Science and Engineering Fair

Spring 2021

- Judged and interviewed grades 1-8 science fair projects

Raleigh, NC

Oyster Restoration Project

Summer 2020

Carteret Community College

Morehead City, NC

SciREN Coast Networking Event

Spring 2020

Pine Knolls Shores Aquarium

Morehead City, NC

Swenson College of Science and Engineering Day

Spring 2018 and 2019

University of Minnesota Duluth

Duluth, MN

Boys and Girls Club of the Northland

Spring 2018

- Volunteered weekly providing educational support

Duluth, MN

Lowell Elementary After School Young Science Program

Spring 2018

- Volunteered bi-weekly to teach science lesson plans to K-6 students

Duluth, MN

Woods Hole Science Stroll

Summer 2017

Marine Biological Laboratory

Woods Hole, MA

American Fisheries Society Outreach at Meyer-Wilkins Elementary

Spring 2017

- Taught fish related lesson plan to K-6 students

Duluth, MN

Swenson College of Science and Engineering Night

Spring 2016

University of Minnesota Duluth

Duluth, MN

Biology Department Seminar Support Volunteer

Fall 2016-Fall 2018

University of Minnesota Duluth

Duluth, MN