

S. Grady Welsh

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Education

Middlebury College

Middlebury, VT

B.A. in Biology, Minor in Education Studies, GPA 4.0

Graduated *summa cum laude* with high honors in Biology, May 2024

Thesis Title: "Post-Fire Bryophyte Colonization: A Comprehensive Survey of the Bryophytes of the Altona Flat Rock"

Thesis Advisor: Dr. Kirsten Coe

Marine Biological Laboratory Semester

Woods Hole, MA

Semester in Environmental Science, Fall 2022

Independent Research Title: Salinity impacts on *Sporobolus alterniflorus* gas exchange and nutrient content in a greenhouse environment.

Research Advisor: Dr. Zoe Cardon

Research Experiences

Middlebury College

Middlebury, VT

Senior Biology Thesis

August 2023 – May 2024

Post-Fire Bryophyte Colonization: A Comprehensive Survey of the Bryophytes of the Altona Flat Rock

- Completed the first comprehensive survey of the bryophytes (mosses, liverworts, and hornworts) of the Altona Flat Rock, a unique jack pine barren ecosystem located in Altona, New York
- Identified 87 unique bryophyte species present at the Altona Flat Rock
- Measured the density of ten of the most common bryophyte species across five levels of fire severity using a modified point-quarter method
- Wrote and published a field guide to the 41 most common and distinct bryophytes of the area, including microscopic and macroscopic photographs of collected samples

Senior Education Capstone

February 2023 – May 2024

Examining Introductory Biology at Middlebury College: A Case Study in Feelings of Belonging in Ecology and Evolutionary Biology

- Considering the importance of feelings of belonging in student success and retention, I examined feelings of belonging among students in the introductory biology class, Ecology and Evolution
- Conducted small-group interviews of students in the Ecology and Evolution class and used qualitative analysis to look at how the curriculum, faculty, and support resources cultivate feelings of belonging and where they fall short
- Conducted demographic surveys of upper-level research students in ecology and evolutionary biology and related disciplines

North Inlet-Winyah Bay National Estuarine Research Reserve

Georgetown, SC

NOAA Hollings Intern

May 2023 – August 2023

Investigating Drivers of Vegetation Reflectance in a South Carolina Salt Marsh

- Used a Unispec-DC to collect incident and reflected light measurements in a salt marsh
- Compared the effects of time, weather, substrate, and elevation on the spectral reflectance of *Spartina alterniflora*
- Supported other work including nutrient loading experiments and RTK surveys of oyster reefs
- Presented findings at NOAA's 2023 Science and Education Symposium

MBL: Semester In Environmental Science

Woods Hole, MA

Independent Research Project

September 2022 – December 2022

Simulating Salt Marsh Drought Conditions: Effects of Salinity on Sporobolus alterniflorus in a Greenhouse Environment.

- Researched photosynthetic and resource allocation response to salinity in *Sporobolus alterniflorus* (syn. *Spartina alterniflora*) in the Cardon Lab at the Marine Biological Laboratory Ecosystem Center
- Used a LiCor-6400 to measure the photosynthesis response of individual plants in an automated tidal system developed by Ross Brown, a collaborating undergraduate
- Presented findings at MBL's 25th Annual Student Independent Research Symposium and the 2023 Middlebury Student Symposium

The Nature Conservancy in Maine

Brunswick, ME

Winter Term Intern

January 2021 – February 2021

- Researched and presented on how best to implement living shorelines with oysters in Maine
- Researched and presented on Department of Marine Resources oyster permitting requirements
- Interviewed local aquaculture farmers about uses for cast-off oysters

Teaching Experiences

Middlebury College

Teaching Assistant: Ecology and Evolution (BIOL 0140)

Sept. 2023 – May 2024

- Assisted professor to teach a curriculum focused on scientific writing, literacy, and research experiences
- Graded assignments and helped students during lab and weekly office hours

Teaching Assistant: Cell Biology (BIOL 0145)

Feb. 2023 – May 2023

- Assisted professor to teach a curriculum focused on research experiences and laboratory techniques
- Graded assignments and helped students during lab and weekly office hours

Lab Preparatory Teaching Assistant: Cell Biology (BIOL 0145)

Sept. 2021 – May 2022

- Prepared solutions and distributed lab equipment before lab
- Organized, cleaned, and inventoried lab and lab equipment

Center for Alaskan Coastal Studies

Homer, AK

Lead Backcountry Educator

May 2024 – Present

- Organized and led backcountry camps focused on food systems, peatland ecology, and marine ecology
- Taught a curriculum focused on helping teens develop backcountry skills and participate in backcountry activities such as backpacking, kayaking, and paddleboarding
- Helped teens develop strategies to assess and mitigate risk in the outdoors

Peterson Bay Field Station Naturalist Intern

May 2022 – August 2022

- Guided hikes and tide-pooling for people ages 8 to 80, teaching ecology, native species, and ethnobotany
- Led overnight camps and created an engaging atmosphere to build comfort in outdoor environments and learn about the natural history of Kachemak Bay
- Researched mosses and compiled a field guide to local mosses

Rippleffect: Outdoor Education Program

Portland, ME

Wilderness Education Guide

May 2021 – August 2021

- Taught a curriculum of leadership development, sea kayak & outdoor skills, and environmental education
- Worked with a co-guide to lead a weekly overnight camp with kayak expeditions to nearby islands
- Managed risk and performed first aid under rapidly changing conditions to keep participants safe

Awards

- 2024 Elbert C. Cole Prize in Biology
 - Biology department award given to a graduating senior in the biology department for exceptional work in biology
- 2024 Phi Beta Kappa Inductee
- 2023 Finalist, Mitchell & Marshall Fellowships
 - For proposed research studying peatlands in the UK and Ireland
- 2023 Goldwater Scholar
 - Awarded for research on salinity response in *Spartina alterniflora*
- 2022 NOAA Hollings Scholar

Publications

Welsh, S. G., and K. K. Coe. 2024. Mosses and Liverworts of the Altona Flat Rock: A Field Guide to the Bryophytes of Altona, New York. Middlebury Biology Department, Middlebury, VT.

https://www.researchgate.net/publication/380728183_Mosses_and_Liverworts_of_the_Altona_Flat_Rock_A_Field_Guide_to_the_Bryophytes_of_Altona_New_York

Welsh, S. G. 2024. Post-Fire Bryophyte Colonization: A Comprehensive Survey of the Bryophytes of the Altona Flat Rock. Middlebury Biology Department, Middlebury VT.

Presentations

Welsh, S. G. 2024, May 13. Moss Mission: A Comprehensive Survey of the Bryophytes of the Altona Flat Rock. Public Thesis Presentation, Middlebury, VT.

<https://drive.google.com/file/d/1GaLogbx-eVg8e8l9ZpquCWz7VZuXctT/view?pli=1>

Welsh, S. G. 2024, April 19. Investigating Feelings of Belonging in Introductory Ecology and Evolution at Middlebury College. Middlebury Spring Symposium, Middlebury, VT.

Welsh, S. G. 2023, August 1. Investigating Drivers of Vegetation Reflectance in a South Carolina Salt Marsh. NOAA Science and Education Research Symposium, Poster Presentation, Washington, DC.

Welsh, S. G. 2022, December 16. Simulating Salt Marsh Drought Conditions: Effects of Salinity on *Sporobolus alterniflorus* in a Greenhouse Environment. Semester in Environmental Science: 25th Annual Student Independent Research Symposium, Marine Biological Laboratory, Woods Hole, MA.

<https://mbl.hosted.panopto.com/Panopto/Pages/Viewer.aspx?id=d056fc5a-a1d4-4437-afac-af64016ab178>

Technical Skills

- RStudio
- Microsoft Office
- Google Suite
- Adobe InDesign
- KBase
- Wildlife Insights
- Lazarus (modeling software)
- Microscopy & microscopic photography
- Micro-pipetting
- Tin capsule sample preparation for C-N analysis
- Plant identification
- Various water and soil sampling and analysis techniques

Certifications

- Wilderness First Responder: SOLO Wilderness Medicine
- CPR/AED: American Heart Association
- Behavioral First Responder, Level 1: Alpenglow Education

Extracurricular

Middlebury Club Nordic

Middlebury, VT

Member

September 2020 – May 2024

Captain

September 2021 – May 2024

Co-president

January 2022 – May 2024

- This club sport competes in the USCSA league for club and D-3 nordic (cross-country) skiing teams. We also take steps to make Nordic skiing more accessible and fun for students at Middlebury.
- Worked together with my co-president to plan and lead practices, coordinate race transportation and logistics, offer free ski rentals to students, design team-branded gear, and teach ski lessons.
- Budgeted a \$6000 budget to fund race fees, team uniforms, transportation, and gear costs while meeting regularly with the Student Activities Office to stay up to date on student organization protocols.

Community Friends

Middlebury, VT

Mentor, Volunteer

March 2020 – May 2024

- Community Friends is a community service organization that matches elementary and middle school students in Addison County, VT with Middlebury College students who serve as mentors
- Met weekly with my community friend Blake, a middle-school student in Bristol, VT
- Frequent activities included catching up about school, going to the dining hall, playing sports, and walking around campus
- Provided a supportive and consistent adult presence in Blake's life for over four years

Middlebury Pranksters Ultimate Frisbee

Middlebury, VT

Member

September 2020 – May 2024

- Competed nationally at the D-3 level for three seasons. The team placed 3rd in 2022, 2nd in 2023, and 5th in 2024.

References

Dr. Kirsten Coe – Thesis advisor
Assistant Professor of Biology
Middlebury College
Middlebury, VT
kcoe@middlebury.edu

Dr. Carolyn Dash – Supervising professor, thesis committee member
Assistant Laboratory Professor of Biology
Middlebury College
Middlebury, VT
cdash@middlebury.edu

Dr. Erik Smith – Supervising research professor
Research Associate Professor, Manager,
University of South Carolina, North Inlet-Winyah Bay NERR
Georgetown, SC
erik@baruch.sc.edu