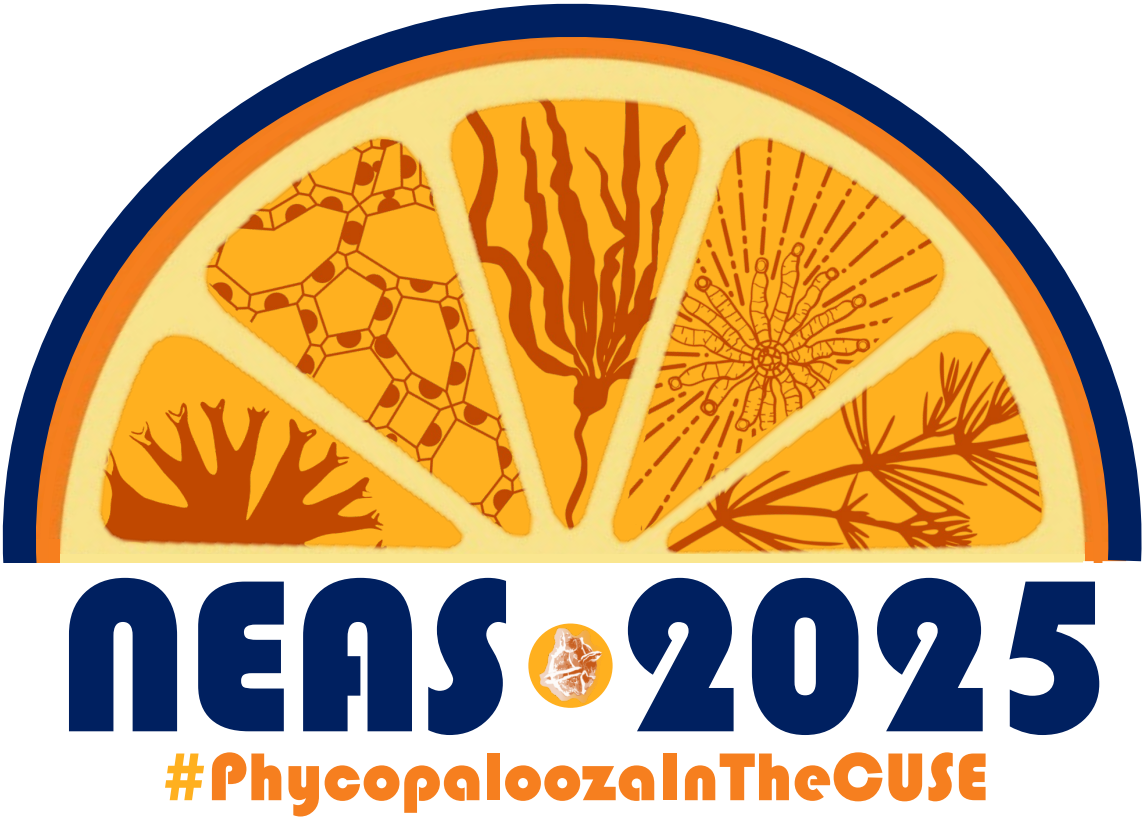
63rd Northeast Algal Society Symposium, April 4-6, 2025



The Craftsman Inn & Suites
7300 E Genesee St, Fayetteville, NY 13066

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63rd Northeast Algal Society Symposium
April 4-6, 2025
Craftsman Inn, Fayetteville, NY

Welcome Message!

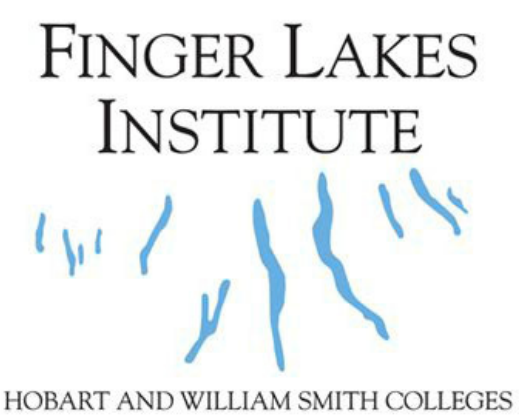
We welcome you to the 63rd Annual Northeast Algal Society Symposium in Fayetteville, NY. This year's meeting kicks off with several events that you won't want to miss, so arrive early and stay late because it's phycology without apology. We have an outstanding lineup of talks, posters, and panelists featuring Dr. Robin Wall Kimmerer, Raining White, and Rick McCourt, as well as vendors ready to update your walls, bookshelves, and laboratories! We can't wait to see you at pre-symposium activities on Friday, April 4th, that will prime a weekend of phycology!

Pre-Symposium Activities

1) **From 5:00 to 7:00:** ***NEAS Vendors***
2) **From 5:00 to 7:00:** ***Registration:*** Pick up your registration materials and join NEAS opening reception/social; catch up with old and new friends alike! The reception will be held at the Craftsman Wood Grille & Taphouse at the Craftsman Inn.
3) **From 5:00 to 7:00:** Continue to enjoy your time at the Craftsman or experience Fayetteville, NY. ***Make sure you ask to be seated with NEAS on the patio! We encourage you to order food and drink! Other options for the evening and beyond include:***
    a. **Wegman's:** A short 2-mile drive: 6789 E. Genesee St, Fayetteville
    b. **Green Lakes State Park:** 4.3-mile drive
    c. **Onondaga Lake State Park:** 13.8-mile drive (Most polluted lake in the US!)
    d. Restaurants:
        i. **Starbucks** – 0.2 miles
        ii. **Panera Bread** – 0.3 miles
        iii. **Papa Gallo Mexican Restaurant** – 0.4 miles
        iv. **Carrabba's Italian Grill** – 0.5 miles
        v. **Bonefish Grille** - 0.5 miles
        vi. **King David's** – 0.7 miles
4) If you are a runner or walker, it's hard to beat Green Lake's "Phyko-5ks"! The website to look at all the trails is http://parks.ny.gov/documents/parks/GreenLakesTrailMap.pdf. See Dominique Derminio for more details.

Sponsors

This year's meeting and the Indigenous Knowledge in Phycology Keynote Speaker and panelists were made possible with the generous support of several organizations, including FlowCam"by Yokogawa Fluid Imaging Technologies, Thermo Fisher, SUNY College of Environmental Science and Forestry, Le Moyne College, and Finger Lakes Institute.



Land Acknowledgment

This land acknowledgement is a first step in explicitly recognizing sovereignty and the ongoing history of the dispossession of Indigenous peoples.

Since location is core to our identity, in name and practice, the CNY Humanities Corridor acknowledges, with respect, that our 11-institution consortium spans the ancestral lands and waterways of the Haudenosaunee people. Corridor partnerships take place on lands of the nations of the sovereign Haudenosaunee Confederacy, founded at least 1,000 years ago at Onondaga Lake. Central New York remains home to the Haudenosaunee: we acknowledge the ongoing history of dispossession across the Confederacy and are grateful to live, work, and share ideas on these lands (CNY Corridor, 2025).

Acknowledgements

Many thanks to our judges: Wilce Graduate Oral Presentation Award (Andreas Holzinger, Sarah Princiotta and Stacy Krueger-Hadfield), the President's Undergraduate Oral Presentation (Thea Popolizio, Brian Wysor, and Ken Karol), Trainor Graduate Poster Award (Diba Khan-Bureau, Dominique Derminio, and Christian Jones), and the President's Undergraduate Poster Award (Robin Matthews, Anne Lizarralde, and Karolina Fucikova). Many thanks to all who volunteered to judge award presentations!

We also appreciate our session moderators: Sarah Whorley, Lindsay Green-Gavrielidis, John Wehr, and Greg Boyer, and of course, our well-seasoned auctioneer, Craig Schneider. We are grateful to Hannah Reich for designing our 2025 PhycopaloozaInTheCUSE meeting logo seen on the cover and on NEAS merchandise (see p. 6). We are grateful to our distinguished guests and hope you enjoy the impressive lineup of phycologists, in addition to the many fantastic presentations on our program by students young and old – it should be an exciting meeting!

We would also like to thank the following Vendors who support NEAS through auction donations and excellent deals on professional and personal phycology décor and books.

1. Scott Balogh, Balogh International Books
2. Savannah Stresser: FlowCam, Yokogawa Fluid Imaging Technologies

Finally, we thank the NEAS membership and all the annual symposium participants and guests, whose ideas, fellowship, and camaraderie make the Northeast Algal Society and this annual symposium an event that we all look forward to each year.

Your friendly symposium conveners,

Karolina, Hannah, Hilary, Ken, and Dominique

PS Don't forget: You can get various conference-themed merchandise in the Northeast Algae Red Bubble store: https://www.redbubble.com/people/northeastalgae/shop

Virtual Attendance Directions

Please have the zoom app downloaded.

Available times, all EST
Saturday: 8:30 AM – 5:30 PM
Sunday: 8:30 AM – 12:00 PM

Join Zoom Meetings
https://cornell.zoom.us/j/97427555965?pwd=zCZkkTw8KVpuO9a2bgpYZJbsxngtv9.1

Or iPhone one-tap (US Toll): +16468769923,97427555965# or +16465189805,97427555965#

Or Telephone:
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Webinar ID: 974 2755 5965 Participant ID: 526873
International numbers available: https://cornell.zoom.us/u/abakS22D1

Or an H.323/SIP room system:
Dial: 144.195.19.161 (US West) or 206.247.11.121 (US East)
Webinar ID: 974 2755 5965 Password: 347712

Or a QR Code:

SCAN ME

NEAS Meeting Code of Conduct

NEAS is committed to creating a safe and welcoming environment for all attendees. To do so, all attendees are expected to abide by the following Code of Conduct:

- All attendees will treat each other with respect.
- Considerate, respectful, and collaborative communication is expected.
- Personal attacks directed toward individuals or disruptions of the virtual portions of the meeting (*e.g.*, "zoom-bombing") will not be tolerated.
- Examples of unacceptable behavior include, but are not limited to, written and verbal comments related to physical appearance, body size, race, religion, national origin, gender, gender identity and expression, and sexual orientation, as well as use of nudity and/or sexual images in presentations or chats.
- Downloading and capturing information presented is strictly prohibited without the written permission of the authors. This applies to oral and poster presentations.
- Individuals engaging in behaviors that violate this code of conduct will be removed from the meeting by the moderator/host.

Keynote Speakers

We are excited to host our keynote speakers, Dr. Robin Wall Kimmerer, Raining A, White, and Dr. Rick McCourt! Our speakers will offer perspectives on Indigenous knowledge in phycology and related fields.

Dr. Wall Kimmerer is a Potawatomi botanist, author, and the director of the Center for Native Peoples and the Environment at SUNY ESF. Aside from her scholarly work, she has authored several books, including *Braiding Sweetgrass: Indigenous Wisdom, Scientific Knowledge and the Teachings of Plants* and *Gathering Moss: A Natural and Cultural History of Mosses*, and most recently The Serviceberry: Abundance and Reciprocity in the Natural World.

Raining A. White is a member of the Leech Lake Band of Ojibwe and works at the Leech Lake Division of Resource Management. He studies the ecology of freshwater macrophytes (Characeae) and their role in wild rice (manoomin) production and success. His focus is specifically on the interactions between the invasive *Nitellopsis* and wild rice.

Dr. Rick McCourt is a long-time member of NEAS, a professor, and a botany curator at the Academy of Natural Sciences of Drexel University. His recent work includes the curation of the historic Lewis and Clark collection and the project Botany of Nations: the Lewis and Clark Herbarium and Indigenous Knowledge.

NEAS Executive Committee

President: Brian Wysor (2024 – 2026)

Vice President: Election

Secretary: Sarah Princiotta (2022 – 2027)

Treasurer: Lindsay A. Green-Gavrielidis (2023 – 2028)

Membership Director: Election

Nominations: Dominique Derminio (2024 - 2026)

Chair Elect Nominations: Election

2024 Convenors: Brian Wysor, Lindsay A. Green-Gavrielidis, Craig Schneider

2025 Convenors: Hilary McManus, Karolina Fucikova, Hannah Reich, Dominique Derminio, Kenneth Karol

Members at Large: Ken Karol (2023 – 2026), Anne Lizarralde (2022 – 2025)

Colt Development Committee: Amanda Savoie (chair, 2021 – present), Greg Boyer, Craig Schneider, John Wehr

Publications Committee: vacant

Website: Chris Neefus

Candidates for NEAS Executive Committee

We will hold an election during the meeting for certain positions. You can read more about each position in the NEAS Officers Manual:
https://northeastalgae.org/organization_docs/NEAS_Officersmanual_March2025.pdf

Program Overview

Friday, April 4

Time	***Event***	***Location***
5:00 – 7:00 PM	Registration and Auction Donations	Craftsman Inn Skaneateles Ballroom
5:00 – 7:00 PM	Friday night social	Craftsman Wood Grille & Tap House

Saturday, April 5

Time	***Event***	***Location***
6:30 – 8:20 AM	Breakfast	Craftsman Inn Skaneateles Ballroom
7:30 – 8:20 AM	***Poster set-up (P1-P14),*** and auction donations	Craftsman Inn Skaneateles Ballroom
8:00 – 10:00 AM	Registration	Outside Skaneateles Ballroom
8:00 – 8:30 AM	Presentation upload	Skaneateles Ballroom
8:30 – 8:45 AM	Welcome remarks	Skaneateles Ballroom
8:45 – 9:45 AM	***Session 1:*** Student Award Talks 1	Skaneateles Ballroom
9:45 – 10:15 AM	Break - Coffee	Skaneateles Ballroom
10:15 – 11:45 PM	***Session 2:*** Student Award Talks 2	Skaneateles Ballroom
11:45 – 1:15 PM	Lunch Buffet style	Skaneateles Ballroom
12:00 – 1:00 PM	EC meeting	Private Dining Room
1:15 – 2:45 PM	***Session 3:*** Poster Session 1	Skaneateles Ballroom
2:45 – 3:00 PM	Break – Coffee ***Poster Take Down and Set Up (CP1-CP11)***	Skaneateles Ballroom
3:00 – 3:30 PM	***Session 4:*** Student Contributed Talks	Skaneateles Ballroom
3:30 – 4:00 PM	***Session 5:*** Contributed Talks 1	Skaneateles Ballroom
4:00 – 5:00 PM	***Session 6:*** Poster Session 2	Skaneateles Ballroom
6:30 – 9:30 PM	NEAS Annual Banquet and Student Benefit Auction A buffet meal will begin at 7:00 PM. There will be a cash bar available.	Skaneateles Ballroom

Sunday, April 6

Time	***Event***	***Location***
7:00 – 8:20 AM	Breakfast and book donations	Skaneateles Ballroom
8:00 – 10:00 AM	Registration	Outside Skaneateles Ballroom
8:15 – 8:30 AM	***Presentation upload***	Skaneateles Ballroom
8:30 – 9:30 AM	***Session 7:*** Contributed Talks 2	Skaneateles Ballroom
9:30 – 10:00 AM	Break – Coffee ***Panel Presentation upload***	Skaneateles Ballroom
10:00 – 12:00 PM	***Session 8:*** Panel Discussion	Skaneateles Ballroom
12:00 – 1:00 PM	Business Meeting	Skaneateles Ballroom
1:00 PM	Pick up boxed lunches	Skaneateles Ballroom

Departure! See you all next year!

If you are hanging around Fayetteville for a while, stop by Green Lakes State Park or Onondaga Lake State Park!

General Program: 63rd Northeast Algal Society Symposium, Fayetteville, New York

Friday, April 4th, 2025

5:00 – 7:00 PM ***Evening Registration and Friday Night Social***
Craftsman Wood Grille & Tap House

Saturday, April 5th, 2025

6:30 – 8:20 AM ***Breakfast***

7:30 – 8:20 AM ***Poster Set-up***
Skaneateles Ballroom
Poster setup for Saturday Poster Session 1 (P1-P14)

8:00 – 10:00 AM ***Morning Registration***
Hallway outside Skaneateles Ballroom

8:00 – 8:30 AM ***Presentation Uploads for Session 1***
Skaneateles Ballroom

8:30 – 8:45 AM ***Welcome and Opening Remarks***
Skaneateles Ballroom

8:45 – 9:45 AM ***Session 1: Student Award Talks 1*** **– Sarah Whorley**
Skaneateles Ballroom

President's Award Candidates

8:45 – 9:00 **The Disappearance of *Ceratophyllum demersum* and its Impacts on Summer Phytoplankton Communitas In Faylor Lake (Snyder Co, Pa).** Michael Rose and Dr. Jack Holt *(Abstract O1)*

9:00 - 9:15 **Patterns of *Didymosphenia geminata* Abundance in the Colorado River.** Eve Byers, Dr. John D. Wehr, & Mia Wrey *(Abstract O2)*

9:15 – 9:30 **Evaluating the Influence of a Bacterial Symbiont (*Marinobacter* sp.) on the Cell Cycle of its Dinoflagellate Host (*Symbiodinium microadriaticum*).** Mac Collier, Genevieve Dallmeyer-Drennen, & Hannah Reich. *(Abstract O3)*

9:30 – 9:45 **Molecular Characterization of *Bryopsis* Species Richness in the Western North Atlantic.** Abigail St. Jean & Brian Wysor. *(Abstract O4)*

9:45 – 10:15 ***Coffee Break and Presentation Uploads for Session 2***
Skaneateles Ballroom

10:15 – 11:45 PM ***Session 2: Student Award Talks 2*** **– Lindsay Green-Gavrielidis**
Skaneateles Ballroom

Wilce Award Candidates

10:15 – 10:30 **Host Sweet Host: Symbiodiniaceae Gene Expression Changes Based on Host Identity.** Caleb C. Butler, Raúl A. González-Pech, Dustin Kemp, Todd C. LaJeunesse. *(Abstract O5)*

10:30 – 10:45 **Hidden Biodiversity: Unraveling Cryptic Species Complexes in the Galaxauraceae (Nemaliales, Rhodophyta)**. Margaret Cassidy & Gary Saunders. *(Abstract O6)*

10:45 – 11:00 **Spatiotemporal Shifts of Bloom-Forming *Ulva* in New Haven Harbor and Their Physiological Response to Climate Change.** Ujjal Banik & Amy Carlile. *(Abstract O7)*

11:00 – 11:15 **Investigating the Differential Expression of Genes Between Molgulid Tunicates, Infected and Uninfected, with *Nephromyces.*** Marissa Mehlrose & Christopher Lane. *(Abstract O8)*

11:15 – 11:30 **Harnessing Target Capture to Explore the Cryptic Diversity of Lichen Symbionts.** Zachary M. Muscavitch, Bernard Goffinet, & Louise A. Lewis. *(Abstract O9)*

11:30 – 11:45 **Elucidating Cell Wall Structure of Facultative Symbiodiniaceae Species Using Glycome Profiling.** Clancy McIntyre, Charles T Anderson, Hong Ma, & Todd LaJeunesse. *(Abstract O10)*

11:45 – 1:15 PM ***Lunch***
Skaneateles Ballroom

12:00 – 1:00 ***Executive Committee Meeting/Lunch***
Private Dining Room

1:15 – 2:45 PM ***Session 3: Poster Session 1: For Student Awards Competition***
Skaneateles Ballroom

President Award Posters

P1 - Photosynthetic Pigments in Several Strains of Three *Microcoleus* Species (Cyanobacteria) from Streams in California. Alexander Peterson, R. Christian Jones, Sydney Brown, Jacob Mormado, & Rosalina Christova

P2- Putative Invasive Diatoms in the West Branch of the Farmington River: Using Sediment Cores to Determine their Historical Presence. Lily Bentley, Kathryn Laibrandt, Reilly Stiefel, Thomas Anderson, Diba Khan-Bureau, William Ouimet, & Louise A. Lewis

P3- Seasonal Variation of Epithilic Algae in a Small Suburban Stream with an Emphasis on *Microcoleus.* Nicholas T. Lewis, Hannah Toney, Rosalina Christova, & R. Christian Jones

P4 - Benthic Diatom Community Dynamics in Seneca-Keuka Lake Watersheds: Microbial Indicators of Freshwater Ecosystem Health. Alana Modugno, Dominique S. Derminio, & Gylla MacGregor

P5 - The Effect of pH on the Growth of Cyanobacteria. Lana Novenche and Dominique S. Derminio.

P6 - Isolating and Culturing Freshwater Mixoplankton. Michael Rose, Sophie Charvet, & Jack Holt.

P7 - Who's Afraid of the Pyrodinium? An inspection of the Burglar Alarm Hypothesis.
Raymond Bailey, Gretta Pesesky, Malayna Shiels, Genevieve Dallmeyer-Drennen, Joshua Drew, & Hannah Reich.

P8 - Environmental Effects Modulating the Distribution of *Pyrodinium bahamense Cysts* in Vieques, Puerto Rico. Venuri Atulugama, Sasha Barley, Rory Gretsky, Emily Grzywacz, Genevieve Dallmeyer-Drennen, Joshua Drew, & Hannah Reich.

P9 - Investigation into the Patchy Dispersal of *Choreocolax Polysiphoniae* Populations. Giovanni S. Ferreri, Gabrielle M. Kuba, Emily M. Molino, Eric D. Salomaki, & Christopher E. Lane

P10 - Examining Bacterial Siderophore Production Within Anemone Tripartite Symbiosis.
Rory Gretsky, Genevieve Dallmeyer-Drennen, & Hannah Reich

Trainor Award Posters

P11 - Why Snow Algal Reproduction Matters. Alexander Geragotelis, Robin Kodner, Honu Pata, Trinity Hamilton, & Stacy A. Krueger-Hadfield

P12- Functional Trait Analysis Reveals Distinct Ecotypes in the Marine Alga *Ascophyllum Nodosum*. Marcella Heineke & David Kimbro[1]

P13 - Uncovering Cryptic Diversity of *Graphis Scripta* Lichen Symbionts Reveals a Surprising Pattern of Co-Occurrence. Noah A. Manuel, Zachary M. Muscavitch, Bernard Goffinet, & Louise A. Lewis.

P14 - Will *Sargassum* Become the Dominant Canopy in Southern New England? Kaleb Boudreaux

2:45 – 3:00 PM ***Coffee Break***
Skaneateles Ballroom

2:45 – 3:00 PM ***Poster Tear Down and Set-up***
Skaneateles Ballroom
Poster setup for Saturday Poster Session 2 (CP1-CP11)

2:45 – 3:00 PM ***Presentation Uploads for Sessions 4 and 5***
Skaneateles Ballroom

3:00 – 3:30 PM ***Session 4: Student Talks*** **– Moderator, Greg Boyer**
Skaneateles Ballroom

3:00 – 3:15 **Computational Characterization of the Anticancer Properties of Several Algae-Derived Peptides.** Mary Biggs & Ipsita Banerjee. *(Abstract O11)*

3:15 – 3:30 **Nuclear Genome Characterization of *Gracilariophila oryzoides* and *Gracilariopsis andersonii*.** Gabrielle M. Kuba and Christopher E. Lane. *(Abstract O12)*

3:30 – 4:00 PM ***Session 5: Contributed Talks 1*** **– Moderator, Greg Boyer**
Skaneateles Ballroom

3:30 – 3:45 **Genetic and morphological variation in the genus *Zygogonium* (Zygnematophyceae, Charophyta) from localities in Europe and North America and description of *Z. angustum***. Rosalina Stancheva, Louise A. Lewis, John Hall, Tereza Šoljaková, Charlotte Permann, & Andreas Holzinger *(Abstract O13)*

3:45 – 4:00 **Sexual Reproduction and 3D Reconstruction of Zygospores in *Spirogyra* and *Zygnema* (Zygnematophyceae).** Andreas Holzinger, Charlotte Permann, Sebastian Antreich, Notburga Gierlinger, Pierre-Henri Jouneau, Clarisse Uwizeye, Denis Falconet, & Eric Marechal. *(Abstract O14)*

4:00 – 5:00 PM ***Session 6: Poster Session 2***
Skaneateles Ballroom

Contributed Posters

CP1 - The Mid-Atlantic Coastal Marine Ecological Monitoring Program at Vims Eastern Shore Laboratory, Wachapreague, Virginia, USA. PG Ross, Stacy A. Krueger-Hadfield, Darian M. Kelley, & Richard A Snyder.

CP2 - Species Diversity and Abundance of Marine Macroalgae on Anguilla and Double Shot Islands, Washington County, Maine. Jordan Chalfant, Glen Mittelhauser, & Amanda Savoie.

CP3 - The Effect of Light Intensity on the Growth of Cyanobacteria and Chlorophytes. Catherine Nicolo-Hamblin & Dominique S. Derminio.

CP4 - Tolerance to Freezing Stress in Benthic Freshwater Diatoms of the *Pinnularia* Genus: Comparison of Polar, Alpine, and Temperate Strains. Eva Hejduková, Jan Kollár, & Linda Nedbalová.

CP5 - *Microseira wollei* Photosynthetic Rate and Viability Over an Annual Cycle in the Tidal Freshwater Potomac River. Hannah Toney & R. Christian Jones.

CP6 - Limiting Nutrients for Five Finger Lakes Across Summer Months. Lisa B. Cleckner, Quinn Jones, & Trevor Massey.

CP7 - *Pyrodinium bahamense* Abundance in Vieques, Puerto Rico. Liam Bonner, Caitlin Krauth, Genevieve Dallmeyer-Drennen, Joshua Drew, & Hannah Reich.

CP8- Light and Vertical Migration of Cyanobacteria in a Shallow Eutrophic Lake Revisited. Dominique Derminio, Zacharias Smith, Bofan Wei, Matt Hartzheim, Chris Japinga, Kaela Natwora, and Gregory L. Boyer.

CP9 - An Update on "Protecting Minnesota's Beneficial Macroalgae: All Stoneworts Aren't Starry." Victoria D. Davis, Donna J. Perleberg, Raining A. White, Kate A. Hagsten, Melinda Nevillz, Paul J. Radomski, & Kenneth G. Karol.

CP10 - Molecular and Taxonomic Assessment of Red Algal Biodiversity and Introduced Species on Massachusetts' North Shore. Olivia Davis, Gio E. Corbett, & Thea R. Popolizio.

CP11 - Evaluation of Aeration for the Mitigation of HABs. Anne M. McElwee, Kenneth Belfer, & Gregory L. Boyer.

5:00 PM ***Poster Session 2 Tear Down***
Skaneateles Ballroom

6:30 – 9:30 PM ***Social & Banquet, Awards, Silent & Live Auctions***
Skaneateles Ballroom

Sunday, April 6th, 2025

7:00 – 8:20 AM ***Breakfast and Book Donations***
Skaneateles Ballroom

8:00 – 8:30 AM ***Presentation Uploads for Session 6***
Skaneateles Ballroom

8:30 – 9:30 AM ***Session 7: Contributed Talks 2*** **– Moderator, John Wehr**
Skaneateles Ballroom

8:30 – 8:45 **How Much of a Problem is Winter Road Salt for Stream Periphyton: A Year-Long Evaluation of Salinity Effects on Stream Periphyton Biochemistry.** Sarah B. Whorley, Jeffrey J. Law, John D. Wehr, Jeffrey S. Heilveil**.** *(Abstract O15)*

8:45 – 9:00 **Seasonal Development of Snow Algal Blooms in Mountain Forests.** Linda Nedbalová, Lenka Procházková, Roman Juras, Eva Hejduková, & Milena Kociánová. *(Abstract O16)*

9:00 – 9:15 **Growing Kelps in Tank Culture: Findings from Two Interspecific *Saccharina* Hybrid Strains**. Daniel J. Gossard, Hadley Kerr, Morgan Anthony, Amy Jones, Sarah Pierce, & Scott Lindell. *(Abstract O17)*

9:15 – 9:30 **SOAP BUBBLE: Symbiotic Organisms are Associated with freshwater Porifera But our Understanding of Benthic Biodiversity is Limited in these Ecosystems.** Hannah G. Reich, Julia A. Maresca, Genevieve Dallmeyer-Drennen, Stephanie Amaro, Micheal Bianchi, Kylie Perlow, and Aaron T. Ninokawa. *(Abstract O18)*

9:30 – 10:00 AM ***Coffee Break***
Skaneateles Ballroom

9:30 – 10:00 AM ***Presentation Uploads for Session 7***
Skaneateles Ballroom

10:00 – 12:00 PM ***Session 8: Panel Discussion*** **– Moderator, Hilary McManus**
Panelists: Dr. Robin Wall Kimmerer, Raining A, White, and Dr. Rick McCourt
Skaneateles Ballroom

11:00 AM ***Room checkout***

12:00 – 1:00 PM ***Annual NEAS Business Meeting – Brian Wysor, President***
Skaneateles Ballroom

Boxed-lunches available for the business meeting

Abstracts

Oral Presentation Abstracts

O1 - THE DISAPPEARANCE OF *CERATOPHYLLUM DEMERSUM* AND ITS IMPACTS ON SUMMER PHYTOPLANKTON COMMUNITAS IN FAYLOR LAKE (SNYDER CO, PA) *(President's Award Candidate)*

Michael Rose and Dr. Jack Holt

Biology, Susquehanna University, Selinsgrove, PA, 17870

Faylor Lake, a reservoir within the west branch of the upper Middle Creek watershed, has a total volume of 0.7×10^6 m^3 and a mean depth of 1.24 m. This study examines the phytoplankton communities during the months of June and July in 2023 and 2024. In 2023, phytoplankton was dominated by Chlorophyta when weighted by biovolume, indicating a stable and uniform assemblage. The average importance of Cyanobacteria increased from .02% in 2023 to 27.68% in 2024. The observed shifts in phytoplankton communities correspond with the near disappearance of *Ceratophyllum demersum*, a common free-floating vascular plant that had been abundant throughout the lake in 2023 but was found only in small clumps along the shoreline in 2024. This loss of *Ceratophyllum demersum* likely impacted nutrient cycling, habitat availability, and light penetration in the water column, contributing to the shift toward an increase in Cyanobacteria and an overall increase in phytoplankton biovolume in 2024.

O2 - PATTERNS OF *DIDYMOSPHENIA GEMINATA* ABUNDANCE IN THE COLORADO RIVER *(President's Award Candidate)*

Eve Byers[1], Dr. John D. Wehr[1], & Mia Wrey[1]

[1]Department of Biological Sciences, Fordham University, Bronx, NY 10458.

I examined ecological and temporal factors predicted to affect growth of the invasive diatom *Didymosphenia geminata* in the Glen Canyon reach of the Colorado River. I processed epiphytic algal samples from macrophytes sampled in 2020 and 2021 for microscopic enumeration and surveyed them using a Zeiss compound DIC microscope. 2020 samples were standardized to numbers of *Didymosphenia* per 100,000 total diatom valves; 2021 data were standardized to *Didymosphenia* per gram dry mass of macrophytes. Along the 15-mile reach of Glen Canyon, peak 2020 *Didymosphenia* density occurred near the -10 and -8 mile sites, while 2021 saw the highest numbers at the -12 and -4 sites. Categorization by collection month revealed patterns of near-zero density in spring and summer of 2020, followed by an autumn peak and winter decrease. Excluding extreme outliers, autumn 2020 averaged approximately 20 standardized *Didymosphenia* per site and declined to 4.5 by December. 2021 followed this trend, though May through July presented far higher raw *Didymosphenia* numbers than in 2020. I predicted diatom growth would be affected by variable flow rates from the dam, macrophyte hosts, and regional drought conditions. However, *Didymosphenia* abundance was highly varied in Glen Canyon and resulted in inconsistent conclusions about seasonal and spatial patterns. Current investigations of

the following sample years and comparison with New York state dam sites further explore flow and depth effects.

O3 - EVALUATING THE INFLUENCE OF A BACTERIAL SYMBIONT (*MARINOBACTER* SP.) ON THE CELL CYCLE OF ITS DINOFLAGELLATE HOST (*SYMBIODINIUM MICROADRIATICUM*) *(President's Award Candidate)*

Mac Collier[1], Genevieve Dallmeyer-Drennen[2] & Hannah Reich[2]

[1]Division of Environmental Science, College of Environmental Science and Forestry, State University of New York, Syracuse, New York 13210 USA. [2]Department of Environmental and Forest Biology, College of Environmental Science and Forestry, State University of New York, Syracuse, New York 13210 USA

The dinoflagellate *Symbiodinium microadriaticum* is a prominent endosymbiont of many marine invertebrate hosts, including reef-forming corals. *Symbiodinium*-bacterial interactions play a fundamental role in the perpetuation of healthy, stress-resilient coral holobiont partner pairings via their contributions to nutrient exchange. Bacterial associates could influence *Symbiodinium* cell cycle via their roles as regulators of growth and fitness, such as increasing nutrient bioavailability and producing secondary metabolites. Although Symbiodiniaceae are primarily asexual, some species have been confirmed via cytological evidence to exhibit facultative meiosis, which would contribute to increased genetic variance and adaptability. Despite the relevance of both reproductive strategy and bacterial symbiont dynamics to the health and growth of *Symbiodinium* under adverse conditions, the extent to which bacteria abundance might affect the cell cycle of their algal host is unclear. The degree to which any impact might be specific to different strains within a single Symbiodiniaceae species is also unresolved. Here, we co-cultured two different strains of *S. microadriaticum* (KB8, rt-362) with *Marinobacter* sp. LZD060 and tracked cell densities for the duration of batch culture experiments. Using an Attune NxT flow cytometer equipped with brightfield imaging capabilities (Cytpix), we explored how automated image analysis can be used as a tool in characterizing the *S. microadriaticum* cell cycle by assessing intraspecific variations in cell growth, cell size, and prevalence of polyploidy indicative of two-step meiosis. This contributes to furthering our understanding of Symbiodinium-bacterial dynamics, and to the refinement of novel techniques that can be used to characterize these dynamics.

O4 - MOLECULAR CHARACTERIZATION OF *BRYOPSIS* SPECIES RICHNESS IN THE WESTERN NORTH ATLANTIC *(President's Award Candidate)*

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Bryopsis is a species rich genus of siphonous green algae known for its feathery and sometimes iridescent appearance. There are two species of *Bryopsis* in Rhode Island (*Bryopsis plumosa* and *B. hypnoides*) but preliminary DNA Barcoding data suggest at least three species

are present. Given their potential for causing environmental problems through biological invasion, and their pharmacological potential, being able to identify species is critically important. My project attempts to clarify *Bryopsis* species richness by assessing DNA sequence variation from specimens collected throughout the Western North Atlantic, which is home to 13 species of the 59 known worldwide.

O5 - HOST SWEET HOST: SYMBIODINIACEAE GENE EXPRESSION CHANGES BASED ON HOST IDENTITY *(Wilce Award Candidate)*

Caleb C. Butler[1], Raúl A. González-Pech[1], Dustin Kemp[2], Todd C. LaJeunesse[1]

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Corals reliant on photosynthetic dinoflagellates vary in colony morphology, evolutionary history, and even intracellular conditions where symbionts reside. Here, we investigate how baseline gene expression changes in the generalist symbiont, *Durusdinium trenchii* across three divergent host corals—*Acropora muricata*, *Coelastrea aspera*, and *Psammocora digitata*—and also compared it to its specialist sister species, *D. glynni* in *Pocillopora acuta*. Clustering and differential expression analyses revealed host-specific gene expression patterns related to stress response, nutrient transport, and genes implicated in host-symbiont communication. Overall, our results underscore that the host environment is a critical driver of symbiont gene expression, emphasizing the importance of integrating host-symbiont specific factors into assessments of coral resilience in changing oceans.

O6- HIDDEN BIODIVERSITY: UNRAVELING CRYPTIC SPECIES COMPLEXES IN THE GALAXAURACEAE (NEMALIALES, RHODOPHYTA) *(Wilce Award Candidate)*

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In 2010 and 2012, molecular assisted alpha taxonomic (MAAT) surveys were conducted in eastern Australia, with a particular emphasis on Lord Howe Island and Norfolk Island, to assess true macroalgal biodiversity for these remote areas. DNA barcoding using COI-5P and *rbc*L-3P of these collections revealed six genetic groups assignable to the red algal family Galaxauraceae. There are currently 56 accepted species in this family, although surveys such as these have revealed numerous novel genetic groups requiring taxonomic treatment. Many of these taxa have added to growing cryptic species complexes, notably under the epithets *Dichotomaria marginata*, *D. obtusata*, *Galaxaura rugosa* and *Tricleocarpa cylindrica*. However, a lack of molecular data from holotype and/or topotype material has hindered taxonomic decisions in this family. This study sequenced Western Atlantic material for *D. obtusata* and *G. rugosa* to establish "true" species concepts for genetic comparison. This allowed for the description of three novel species endemic to eastern Australia, as well as the resurrection of two previously synonymized taxa with type localities in this region. This MAAT study of the Galaxauraceae contributed to an updated picture of the eastern Australian marine flora, further unraveled cryptic

species complexes in this family, and provided molecular data that will contribute to a taxonomically informed reference library in future research.

O7 - SPATIOTEMPORAL SHIFTS OF BLOOM-FORMING *ULVA* IN NEW HAVEN HARBOR AND THEIR PHYSIOLOGICAL RESPONSE TO CLIMATE CHANGE *(Wilce Award Candidate)*

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The green macroalgal genus *Ulva* is known to form troublesome blooms globally, negatively affecting marine ecosystems by deteriorating water quality and smothering other organisms. This study investigated the biodiversity of bloom-forming *Ulva* around New Haven Harbor (NHH), its impact on water quality, and physiological responses to environmental conditions expected with climate change. Phylogenetic analysis of the chloroplast gene *rbc*L from 100 samples identified at least eight *Ulva* species across four locations in NHH. Compared to a 2015 study from the same location, this represents an increase in the number of identified species while *Ulva compressa* remains the dominant bloom forming alga. Water quality analysis comparing bloom and non-bloom zones demonstrated that the ulvoid bloom significantly deteriorated water conditions by depleting dissolved oxygen and water nutrient concentrations. The impact of rising seawater temperature and acidification on photosynthesis and growth of *Ulva* were examined using mesocosm experiments under four treatments: control, high temperature, low pH, and combined high temperature and low pH. The combined treatment resulted in the highest electron transport rate (ETRmax), daily growth rate (DGR), and specific growth rate (SGR). These results indicate that acidic and warmer seawater conditions could lead to more severe and frequent ulvoid blooms.

O8 - INVESTIGATING THE DIFFERENTIAL EXPRESSION OF GENES BETWEEN MOLGULID TUNICATES, INFECTED AND UNINFECTED, WITH *NEPHROMYCES* *(Wilce Award Candidate)*

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Nephromyces spp. are members of the phylum Apicomplexa, which is known to be comprised largely of parasitic lineages. *Nephromyces* spp. reside within a specialized compartment in molgulid tunicates, called the renal sac, and have been described as beneficial to their host tunicate. However, the near 100% infection rate of adult molgulid tunicates that do not appear to be harmed by infection, has thus far been the only evidence of benefit. Tunicates show no evidence of differing growth or reproduction rates between infected and uninfected individuals. The goal of this study is to determine the nature of the relationship between *Nephromyces* and their host tunicate. To determine whether there is active, passive or no exchange of metabolites, we have sequenced the transcriptomes of wild caught infected tunicates, lab raised infected

tunicates and uninfected, lab raised, tunicates. An examination of the differential gene expression between these groups will allow for the determination of what effect, if any, *Nephromyces* have on their host tunicate.

O9 - HARNESSING TARGET CAPTURE TO EXPLORE THE CRYPTIC DIVERSITY OF LICHEN SYMBIONTS *(Wilce Award Candidate)*

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Fog lichens (*Niebla* and *Vermilacinia*) comprise 87 fungal species along the Pacific coast of the Americas. The circumscription of these taxa remains partially dubious due to variation in morphology, substrate preference, habitat, and secondary chemistry – suggesting underestimated diversity. Even less is known about the green algal photobionts of fog lichens, *Trebouxia* (Trebouxiophyceae) – the most common eukaryotic lichen photobiont. Its taxonomy is complicated by culturing challenges and cryptic morphology, and although molecular tools have revealed 100+ undescribed *Trebouxia* species, more comprehensive studies remain constrained by low biomass of photobionts in lichens. To characterize these cryptic fog lichen symbionts within a phylogenomic context, we developed custom target capture baits for the symbionts, targeting 228 algal and 743 fungal loci. We tested metagenomic libraries of fog lichens for parallel target capture, reducing library preparation costs while capturing both fine- and broad-scale phylogenomic resolution of both symbionts. We demonstrate this method is effective with highly fragmented DNA from herbarium specimens, supports reusing and retaining limited libraries for taxonomically important samples, is more efficient than metagenomic shotgun sequencing, and targets homologs across Chlorophytina and Leotiomyceta – supporting a core set of genes for future studies. Our results highlight the potential of parallel capture for studying other symbiotic systems, such as corals and anemones, where low-abundance symbionts play key ecological roles but remain difficult to characterize.

O10 - ELUCIDATING CELL WALL STRUCTURE OF FACULTATIVE SYMBIODINIACEAE SPECIES USING GLYCOME PROFILING *(Wilce Award Candidate)*

Clancy McIntyre[1], Charles T Anderson[1], Hong Ma[1], & Todd LaJeunesse[1]

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The relationship between reef-building corals and their dinoflagellate symbionts (Family: Symbiodiniaceae) is the foundation for a major ecosystem on Earth. Symbiodiniaceae are diverse and support a broad diversity of invertebrates which need them to survive; the molecular communication between both partners involving signaling, recognition, and nutrient transfer is complex and not well understood. The interface for this communication occurs at the symbiont cell wall, which functions as both a barrier and filter that modulates the flux of molecules necessary to maintain this mutualism. Symbiodiniaceae cell walls are structurally enigmatic in the context of molecular communication; their cell walls are bound in vesicles found beneath

their plasma membranes (called amphiesma) and are made primarily of cellulose, proteins and glycoproteins. Symbionts capable of living within and outside a host undergo a visible reduction in cell wall thickness for intracellular life, but it is unknown whether a change in cell wall molecular composition is responsible for this adaptation. Glycome profiling, an approach often used to study plant cells, was used to characterize the pectins and hemicelluloses in *Symbiodinium microadriaticum* living in vitro and in hospite. This data combined with bioinformatic analyses of cell wall modification genes mined from available Symbiodiniaceae transcriptomes against the CAZY (Carbohydrate-Active Enzymes) database provides insight into which carbohydrates are potentially important to cell wall structure and remodeling.

O11- COMPUTATIONAL CHARACTERIZATION OF THE ANTICANCER PROPERTIES OF SEVERAL ALGAE-DERIVED PEPTIDES.

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In this work, the anticancer targeting abilities of four antimicrobial peptides (AMPs) isolated from algae were characterized by evaluating their binding abilities with proteins that are over-expressed in several cancer types. In particular, the protein receptors Fibroblast Growth Factor Receptor 2 (FGFR2) and Vascular Endothelial Growth Factor Receptors 2 (VEGFR2) were investigated due to their respective roles in uncontrolled cell-growth and angiogenesis. In addition, both receptors have received comparatively little attention in cancer targeting, making them valuable candidates for novel therapeutics. In addition to wild-type FGFR2, a common gatekeeper mutant (V564F) responsible for drug resistant phenotypes was also investigated to characterize the ability of candidate peptides to overcome drug resistance. For all receptors, the kinase domain was studied due to its key involvement in kinase activity and ATP binding. In addition, the ligand binding domain of VEGFR2 was also examined due to its vital role in VEGFR2 functioning and kinase activity. Through this work, we have identified one peptide in particular (Pep1) from *Tetraselmis suecica*, a marine green microalga, as having especially promising binding activity against all studied protein receptors. *T. suecica* has been documented to have antimicrobial and anti-inflammatory properties, and this AMP showed high involvement in the mechanism of antibacterial activity in a recent work. Based on our findings, Pep1 is an ideal candidate for further study and characterization as a potential novel cancer targeting agent.

O12 - NUCLEAR GENOME CHARACTERIZATION OF *GRACILARIOPHILA ORYZOIDES* AND *GRACILARIOPSIS ANDERSONII*

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Florideophycean red algae provide a unique model to explore the genetic shifts underlying the evolution of parasitism. Unlike most parasitic lineages, red algal parasites directly infect their red algal hosts, resulting in genetically chimeric cells. Neoplastic red algal parasites have lost their native plastid and incorporate a dedifferentiated host plastid into their spores. This non-

photosynthetic proplastid alters the parasite's dependence on the host, reflecting key metabolic adaptations. While previous studies have characterized organellar genome reduction in red algal parasites, little is known about nuclear genome evolution in these lineages. To address this gap, we sequenced the nuclear genomes of *Gracilariophila oryzoides,* and its host, *Gracilariopsis andersonii*. Specimens were collected from Pigeon Point, Pescadero, CA, and parasite galls were removed from host tissue. PacBio Hi-Fi long-read sequencing and Hi-C genome scaffolding were used to separate closely related host and parasite as "haplotypes". Haplotype data was filtered based on base-pair composition cutoffs to more accurately separate the two species. Species were resolved based on G/C content of 24% to 47% and 47% to 54% representing parasite and host*,* respectively. Nuclear-encoded plastid genes were represented across all haplotypes, however genes associated with photosynthesis were limited in the low G/C assemblies, which is expected for the parasite based on transcriptome data. Additional analysis of metabolic

O13 - GENETIC AND MORPHOLOGICAL VARIATION IN THE GENUS *ZYGOGONIUM* (ZYGNEMATOPHYCEAE, CHAROPHYTA) FROM LOCALITIES IN EUROPE AND NORTH AMERICA AND DESCRIPTION OF *Z. ANGUSTUM*

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The globally distributed genus *Zygogonium* is characteristic for extreme aquatic-terrestrial habitats, but its molecular characterization is poor. We examined the genetic variability, morphology and ultrastructure of *Zygogonium* collected from sites in Austria, Norway, Ireland, Scotland, and the USA. Phylogenetic analysis based on partial sequences of the *psb*C gene distinguished three well-supported groups. The largest group contains representatives from all localities in Europe and the type species *Z. ericetorum* from Austria. It is subdivided to two subgroups, based on the presence of aplanospores with purple residue or round thick-walled akinetes with green or purple content, and one or two chloroplasts. *Zygogonium* representatives from Norway and the USA, represented by vegetative filaments with an intermediate width lacking reproductive/resting cells form another group. *Zygogonium* from Ireland characterized by narrower filaments, cells up to six times longer than wide, and elongated aplanospores will be described as a new to science species *Z. angustum.*

O14 - SEXUAL REPRODUCTION AND 3D RECONSTRUCTION OF ZYGOSPORES IN *SPIROGYRA* AND *ZYGNEMA* (ZYGNEMATOPHYCEAE)

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Zygnematophyceae, a class of streptophyte green algae are the immediate sister group to land plants. Vegetative stress tolerance has been extensively studied and akinets were tolerant against desiccation and temperature. In contrast, sexual reproduction was less investigated and occurs by conjugation, a process resulting in the formation of resistant zygospores. *Zygnema vaginatum* zygospores were investigated by focussed ion beam scanning electron microscopy (FIB-SEM) and *Spirogyra* sp. zygospores by serial block-face (SBF-SEM) resulting in 3D reconstructions. Zygospore walls are composed of three layers, cellulosic endo- and exospore and a mesospore with aromatic compounds as demonstrated by Raman spectroscopy. In *Zygnema* the mesopsore is thick and sculptured. In *Spirogyra* sp. cellulose microfibrils are arranged in an helicoidal pattern. Storage compounds are rearranged during zygospores ripening in both genera. Lipid droplet (LD) production is increased during maturation (50% of volume in *Spirogyra*, 20% in *Zygnema*), in contrast, starch grains of the pyrenoids degrade. We suggest, that the unique cell wall architecture and accumulation of LDs as reserves in zygospores promoted the shift of Zygnematophyceae to terrestrial habitats marked by frequent episodes of dryness.

O15 - HOW MUCH OF A PROBLEM IS WINTER ROAD SALT FOR STREAM PERIPHYTON: A YEAR-LONG EVALUATION OF SALINITY EFFECTS ON STREAM PERIPHYTON BIOCHEMISTRY

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After decades of seasonal winter road salt use, salinity levels in freshwater streams are rising, even during non-winter months when no road salt is used. While several recent studies have documented this increase of salinity in stream water, very little work has been done to examine the effects of this salt on stream biota. We have conducted a year-long investigation of annual road salt effects on stream water chemistry and biota throughout New York State. Selected streams across Western New York, Central New York, and the Hudson River Valley were surveyed from May 2024 to April 2025. We deployed HOBO conductivity loggers to capture high-resolution salinity measurements. Additionally, we visited each stream monthly to collect in situ water chemistry and periphyton biomass for chlorophyll and stoichiometric analysis. Presented here are the trends in periphyton chlorophyll, ash-free dry mass, and phosphorous content as they relate to stream water chemical properties and salinity measurements. Spring and summer months are characterized by mild drought conditions affecting stream flow and water levels. However winter months were heavily influenced by a series of strong winter storms. These findings will be bolstered by future analyses of how these salinity conditions affected biodiversity and fatty acid compounds.

O16 - SEASONAL DEVELOPMENT OF SNOW ALGAL BLOOMS IN MOUNTAIN FORESTS

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Snow algal blooms are a striking feature of mountain and polar regions worldwide. They are formed by specialized microalgae, mostly of the order Chlamydomonadales (Chlorophyta). Although the polar and alpine communities of these extremophiles have received increased attention in the recent period mainly due to their significant influence on snowmelt dynamics, forested areas remain relatively understudied. This study investigates the seasonal development of snow algal blooms on a forested site in the Labský důl Valley in the Krkonoše Mountains (Czech Republic, Central Europe). In March-April 2024, we conducted weekly sampling to capture the changes in physical and chemical characteristics of snow cover and snow algae community composition, including shifts in life cycle stages (ITS2 rDNA metabarcoding combined with light microscopy). The blooms formed by *Chloromonas* spp. appeared earlier than in previous seasons because of warm and rainy weather. We also analyzed the historical database of bloom occurrences (since 1976) in the Krkonoše Mountains to identify the predictors of SA bloom onset and development. Our findings suggest that SA blooms require prolonged melting periods to develop, and ongoing climate change, characterized by shorter winters and earlier, more frequent melting periods, may significantly affect their occurrence.

O17 - GROWING KELPS IN TANK CULTURE: FINDINGS FROM TWO INTERSPECIFIC *SACCHARINA* HYBRID STRAINS

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Over the past seven months, the Lindell Lab at the Woods Hole Oceanographic Institution has utilized indoor open (flow-through) seawater tank systems to inform their Sugar Kelp Selective Breeding Program. We describe these tank systems from a generalized kelp culturing perspective to an experimental design perspective. These systems, before optimization, have yielded kelp individuals up to 3 m over a period of 7 months. We detail the infrastructural transitions we've used for culturing across the life cycle of *Saccharina latissima* and *S. latissima* x *S. angustissima* hybrids. In the context of historic tank seaweed culture studies, we report on our pilots following the growth of interspecific *S. latissima* x *S. angustissima* hybrid strains focusing on the following separately analyzed factors: nutrients, light, density, and photoperiod. Our preliminary findings suggest that (1) increased frequency of nutrient (Jack's Fertilizer) supplementation can enhance kelp hybrid growth, (2) suboptimal growth may occur in kelp hybrids above 500 µmol m^-2 s^-1

PPFD, (3) photoperiod control can affect the production of sorus tissue in kelp hybrids. We outline the next steps this system including testing novel and putatively non-reproductive strains.

O18 - SOAP BUBBLE: SYMBIOTIC ORGANISMS ARE ASSOCIATED WITH FRESHWATER PORIFERA BUT OUR UNDERSTANDING OF BENTHIC BIODIVERSITY IS LIMITED IN THESE ECOSYSTEMS

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Sponges are widespread in freshwater lakes, ponds, rivers and streams throughout North America. However, sponge sensitivity to water quality varies considerably within the family Spongillidae. The distribution of some species within the genus *Spongilla* is restricted to pristine environments with low conductivity, making some lineages tractable indicators for water quality. However, the capacity of *Spongilla* to form associations with endosymbiotic green algae including *Choricystis* and *Lewiniosphaera* may confound the capacity of their hosts to serve as environmental indicators as the ecological success of *Spongilla* might be mediated by different partner pairings. The diversity of *Spongilla* – green algal symbioses throughout New York State as well as the extent to which partner pairing combinations are generalists and occupy a large water quality gradient is unknown. Our preliminary analyses of microalgal 28S Sanger sequences from encrusting and arborescent *Spongilla* morphs collected from Cayuta Creek, Scriba Creek, Oneida Lake, and Cranberry Lake will provide a snapshot of *Spongilla* algal symbiont diversity. Additionally, sanger sequencing of the 16S region from 27 bacterial isolates were reared from a *Spongilla* colony from Cranberry Lake will ascertain the diversity of culturable *Spongilla*-associated bacteria. Further, algal-sponge co-phylogenies will ascertain the extent of host-symbiont fidelity across freshwater environments in New York State as well as inform environmental health indicator taxa selections. Taken together, improving our understanding of the molecular ecology of sponge-microalgal-bacterial symbioses will facilitate the inclusion of utilizing sponges monitoring in water quality and ecosystem health.

Poster Presentation Abstracts

President's Award Posters

P1 - PHOTOSYNTHETIC PIGMENTS IN SEVERAL STRAINS OF THREE *MICROCOLEUS* SPECIES (CYANOBACTERIA) FROM STREAMS IN CALIFORNIA *(President's Award Candidate)*

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Increasing reports of benthic cyanotoxins in California have caused officials to develop notifications and response levels for recreational freshwaters. *Microcoleus*, a filamentous mat-forming cyanobacterium, is one example of cyanobacteria with strains known to produce anatoxins that can negatively impact people, domestic animals and aquatic organisms. We studied four anatoxin-producing strains of *M. anatoxicus* and two non-toxic *Microcoleus* sp. 1 strains isolated from stream watersheds in northern California, and one non-toxic strain *Microcoleus* sp. 2 from southern California. Chlorophyll *a*, Phycocyanin, and Phycoerythrin concentrations were measured by fluorometric methods in these cyanobacterial strains cultured in BG11 medium at 21 °C and under a light irradiance of 100 µmoles/m^2/s on a 12:12 light: dark cycle for 75 and 130 days. In addition, one non-toxic and one toxic strain were cultured in lower and higher nutrient concentrations for 75 days. Visually, the color of the mats changed with age and nutrient conditions, presumably due to variable proportions between the primary and accessory photosynthetic pigments.

P2- PUTATIVE INVASIVE DIATOMS IN THE WEST BRANCH OF THE FARMINGTON RIVER: USING SEDIMENT CORES TO DETERMINE THEIR HISTORICAL PRESENCE *(President's Award Candidate)*

Lily Bentley[1]; Kathryn Laibrandt[1]; Reilly Stiefel[2]; Thomas Anderson[3]; Diba Khan-Bureau[1, 2]; William Ouimet[3]; Louise A. Lewis[2]

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Since their first report in 2012, three nuisance and putative invasive stalk-forming diatoms—*Cymbella janischii, Didymosphenia hullii,* and *Didymosphenia geminata*—are now regularly observed in the West Branch of the Farmington River, Connecticut, U.S.A. These species proliferate under conditions that promote excessive mucilaginous stalk production, coating the riverbed and negatively impacting benthic macroinvertebrates, fish populations, and recreational angling. To investigate their historical presence, we analyzed sediment cores collected using a

vibracorer and identified diatom cells through morphological methods. Sediment cores were also analyzed for organic content, grain size, metals using pXRF, ^{14}C and short-lived radionuclides ^{137}Cs and ^{210}Pb. While interpretation of sediment cores from rivers is generally more challenging than from lake sediments, preliminary findings based on analysis of four cores suggest that the target diatom species are found only recently and do not extend far back into the 20th century. All three species are consistently present in the shallowest, most recent sediment levels; they are not present in deeper sediment levels despite those layers having high levels of ^{137}Cs, suggesting that sediment deposited in the late 1950s to 1980s did not contain them. Ongoing work on additional sediment cores from diverse locations within and adjacent to the river will be essential to validate our findings and ensure the reliability of our conclusions.

P3- SEASONAL VARIATION OF EPITHILIC ALGAE IN A SMALL SUBURBAN STREAM WITH AN EMPHASIS ON *MICROCOLEUS* *(President's Award Candidate)*

Nicholas T. Lewis[1], Hannah Toney[1], Rosalina Christova[1], and R. Christian Jones[1]

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Toxin producing cyanobacteria pose a threat to human and pet health, especially when in areas frequently used by people. Daniel's Run is a first order stream in Fairfax City, Virginia that drains a suburban watershed and is actively used by the community. A potentially toxin-producing cyanobacterium named *Microcoleus* has been found in the stream. The objectives of this study are to understand seasonal variation in epilithic algal communities, especially in *Microcoleus*, the effect of tree canopy, and if an upstream stormwater pond might affect *Microcoleus* incidence and dynamics. Three stations have been selected on Daniels Run which differ in tree canopy levels and distance downstream from the pond. At each site two transects will be laid out and three rocks will be collected at uniformly spaced locations across the stream, placed in individual containers, and kept on ice until it reaches the lab. An additional qualitative sample will be collected for fresh microscopic analysis and to allow for mats not well represented in the quantitative samples to be assessed. Field water quality will be measured with a YSI ProDDS sonde. On selected dates samples will also be collected for water column N and P constituents. In the lab rocks will be scraped of all epithilic algae and aliquots filtered for analysis of chlorophyll a, phycocyanin, dry weight, ash-free dry weight, and taxonomic composition using standard techniques. Selected samples will be analyzed for toxins. Results from the first round of sampling will be presented.

P4 - BENTHIC DIATOM COMMUNITY DYNAMICS IN SENECA-KEUKA LAKE WATERSHEDS: MICROBIAL INDICATORS OF FRESHWATER ECOSYSTEM HEALTH *(President's Award Candidate)*

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Diatoms are an important component of freshwater ecosystems, serving as primary producers and bioindicators of environmental change. Benthic diatoms are highly responsive to variations in water chemistry, making them valuable for assessing ecological conditions. This study examines the composition and distribution of benthic diatom communities in Keuka Lake and surrounding streams, measuring pH and water hardness. Field sampling was conducted across multiple sites, including Point Neamo, Assembly Trail Stream, and the Keuka Lake Outlet Trail, where water quality parameters, including dissolved oxygen, water hardness, pH, conductivity, and temperature, were measured. Epilithic algae were collected for chlorophyll-*a* and diatom community analysis. Diatom samples underwent acid digestion, slide preparation, and taxonomic identification using microscopy. At Point Neamo and Assembly Trail Stream, *Cymbella* was the dominant species, a finding consistent with its preference for oligotrophic environments. The Keuka Lake Outlet Trail community was dominated by *Fragilaria* and *Nitzschia*, a species typically found in eutrophic environments. This difference could be due to variations in nutrient inputs or legacy loads. The findings of this study provide insight into how benthic diatom communities respond to environmental gradients and anthropogenic influences in historically oligotrophic lakes. Given increasing concerns over eutrophication and algal blooms in freshwater systems, understanding diatom dynamics can aid in the development of monitoring programs and water management strategies.

P5 - THE EFFECT OF PH ON THE GROWTH OF CYANOBACTERIA *(President's Award Candidate)*

Lana Novenche[1] and Dominique S. Derminio[1]

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Algae, a diverse group of photosynthetic organisms, play vital roles in various aquatic ecosystems globally. This diversity allows different algal species to thrive under varying environmental conditions, including pH. However, each species likely exhibits a preferred pH range for optimal growth. This study aimed to test the hypothesis that cyanobacterial growth is maximized under slightly basic conditions, specifically between pH 7.5 and 8.5. To assess this, we cultured two cyanobacterial species, *Merismopedia* spp. and *Eucapsis* spp., in Z8 media under controlled conditions, with pH values ranging from 5.5 to 9. Growth was monitored by measuring chlorophyll levels using a Turner Designs Aquafluor Reader, complemented by manual cell counts. After 21 days, *Merismopedia* exhibited a 16-fold increase in chlorophyll concentration at pH 7.5 compared to pH 8.25. By day 28, *Eucapsis* showed a dramatic 150-fold increase in chlorophyll concentration at pH 6 relative to pH 9. These results suggest a species-specific preference for more acidic conditions, particularly for *Eucapsis*. However, we observed that all cultures resulted in a more alkaline environment by the end of the experiment, suggesting that cyanobacteria may actively influence pH levels in their surroundings. This research contributes to a deeper understanding of cyanobacterial ecology, highlighting how pH influences growth dynamics. Moreover, the findings have broader ecological implications, particularly in the context of increasing acidification of various water columns, where lower pH environments may support enhanced initial cyanobacterial proliferation, potentially impacting aquatic ecosystems.

P6 - ISOLATING AND CULTURING FRESHWATER MIXOPLANKTON *(President's Award Candidate)*

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Mixoplankton, a functional group of protists capable of both phototrophy and phagotrophy, are integral to aquatic ecosystems as they bridge primary production and microbial food webs. By being able to harvest light energy and prey on other microorganisms, they play a pivotal role in nutrient cycling, energy flow, and regulating the dynamics of both planktonic and higher trophic levels. Despite their ecological importance, the study of freshwater mixoplankton is hindered by challenges in isolation, cultivation, and taxonomic identification. This study aims to refine methods for isolating and culturing freshwater mixoplankton to facilitate further research into their trophic strategies and ecological functions. Water samples were collected from various freshwater habitats and incubated in Bold's Basal Medium (BBM) under controlled light and temperature conditions. Individual cells were isolated using a modified Pasteur pipette and cultured for further observation. A chrysophyte was successfully isolated and tentatively identified as a species from the genus Ochrostylon. The findings contribute to the development of standardized methodologies for studying mixoplankton, while also enabling future research on feeding behaviors and ecological interactions, thereby providing deeper insights into their role in freshwater ecosystems.

P7 - WHO'S AFRAID OF THE PYRODINIUM? AN INSPECTION OF THE BURGLAR ALARM HYPOTHESIS *(President's Award Candidate)*

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Found throughout bays of the Virgin Islands, the Bahamas, and Puerto Rico, *Pyrodinium bahamense var. bahamense*, a bioluminescent dinoflagellate, is a significant source of ecotourism revenue for local communities. Despite this, the evolutionary advantage of their characteristic bioluminescence is poorly understood. One such hypothesis is the "Burglar Alarm Hypothesis" which posits a unique exploitation of a known predator-prey relationship by *P. bahamense,* essentially utilizing bioluminescence to attract the predators of its own predators. By generating bioluminescence through mechanical stress and mimicking bioluminescence via light blue string lights with varied blink speed frequencies, we intend to track the abundance of *P. bahamense,* copepod predators, and marine fish using zooplankton nets and visual observation. If the "Burglar Alarm Hypothesis" is true, bioluminescence would draw fish to predate upon copepods. We expect a negative correlation between abundance of the fish (summoned by the bioluminescence) and copepod density. The presence of fish would decrease copepod density due to predation or avoidance. We expect a positive correlation between cell density of *Pyrodinium* (cells/mL) and the presence of marine fish due to reduction of the intermediate trophic level. Our findings will contribute to management strategies of the bioluminescent bays illuminating causes

for population fluctuations post-disturbance. This study could shed light on trophic interactions of native fish, dinoflagellate populations, and conservation.

P8 - ENVIRONMENTAL EFFECTS MODULATING THE DISTRIBUTION OF *PYRODINIUM BAHAMENSE CYSTS* IN VIEQUES, PUERTO RICO *(President's Award Candidate)*

Venuri Atulugama, Sasha Barley, Rory Gretsky, Emily Grzywacz, Genevieve Dallmeyer-Drennen, Joshua Drew, Hannah Reich

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The dinoflagellate *Pyrodinium bahamense* var. *bahamense* illuminates the island's renowned bioluminescent bays ("bio bays"), which serve as major drivers of local tourism in Vieques, Puerto Rico. *P. bahamense*, like other dinoflagellates, form cysts: dormant, seed-like structures that settle in the bay sediments, creating dense seed banks that increase future blooms. The objective of this study is to identify the environmental factors correlated with increased *Pyrodinium bahamense* cyst presence and to predict the conditions that contribute to a dense seed bank for continued germination. To achieve this, *Pyrodinium bahamense* cyst presence will be studied within three distinct ecosystems: Mosquito Bay, a tidal stream, and mangrove habitats on the island. Within the mangrove habitats sediment samples will be analyzed from red (*R. mangle*) and black mangroves (*A. germinans*). The density of *P. bahamense* cysts in the sediment and environmental parameters including sediment type, temperature, salinity, water depth, and pH will be measured across sites. By analyzing the data, this study aims to characterize the conditions that influence the distribution of *Pyrodinium bahamense* cysts in Vieques, Puerto Rico. Given the ecological and economic significance of the island's bioluminescent bays, the findings of this study may provide valuable insights for local organizations seeking to understand the future distribution of this vital dinoflagellate species.

P9 - INVESTIGATION INTO THE PATCHY DISPERSAL OF *CHOREOCOLAX POLYSIPHONIAE* POPULATIONS *(President's Award Candidate)*

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Parasites have evolved within the Florideophycean red algae over 100 times. The relationship between host and parasite offers a unique model to study the evolution of parasitism. One well studied host/parasite relationship includes that of *Vertebrata lanosa* and the parasite *Choreocolax polysiphoniae.* Although the ecology and morphology of *C. polysiphoniae* is understood, the dispersal of this parasite is not well studied. *Choreocolax polysiphoniae* population distribution appears non-random, however the role of the host in this distribution is unknown. Samples of uninfected and infected *V. lanosa* were collected from multiple locations around Rhode Island

and Maine throughout 2013 and 2014. The Internal Transcribed Spacer (ITS) region was amplified via PCR and sequenced by Sanger Sequencing. With ITS sequence data from ten samples, no clear clustering has been identified by infected status or by geographic location. Sequence data from more samples will enable us to determine whether the ITS region is useful to characterize the distribution of red algal parasites or identify underlying genetic factors of the host that influence these relationships.

P10 - EXAMINING BACTERIAL SIDEROPHORE PRODUCTION WITHIN ANEMONE TRIPARTITE SYMBIOSIS *(President's Award Candidate)*

Rory Gretsky, Genevieve Dallmeyer-Drennen, & Hannah Reich

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Exaiptasia pallida are bio-symbiotic organisms, making the study of their bacterial communities and siderophore production valuable for understanding the microbiome of threatened coral reefs. The bacterial symbionts within *E. pallida* and their endosymbiotic dinoflagellates (Family: *Symbiodiniaceae*) play a crucial role in their nutrition, highlighting the importance of investigating these microbial populations. We examined bacterial abundances associated with each pillar of the tripartite marine anemone symbiosis consisting of *E. pallida*, bacteria, and *Symbiodiniaceae*. Batch cell cultures of Symbiodiniaceae and bacterial cultures were maintained in incubators at ambient temp/salinity, whereas, *E. pallida* were maintained in aquaria with continuous waterflow at ambient temperature (26°C) and salinity (35 ppt) conditions. Bacterial cell densities were obtained from the bacterial, *Symbiodiniaceae*, and *E. pallida* tripartite symbiosis. Additionally, we examined variation of bacterial abundance across microenvironments within the *E. pallida* aquaria water samples were collected from various locations within the *E. pallida* habitat, including inside the tank, near the base of the anemones, and within the tentacle boundary as well as before and after routine brine shrimp feedings. Next, a Chrome Azurol S (CAS) assay was used to determine bacterial secretion of Fe-chelating ligands which are hypothesized to serve as a critical nutritional currency within this tripartite symbiosis. Given that coral reefs are dynamic yet increasingly threatened ecosystems, gaining insight into their

Trainor Award Posters

P11 - WHY SNOW ALGAL REPRODUCTION MATTERS. *(Trainor Award Candidate)*

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Snow algae are an understudied group of eukaryotes found in snowy habitats worldwide. Most snow algae cannot be easily cultured in a laboratory, so there are many gaps in basic knowledge, particularly in terms of their life cycle and reproductive modes. We seek to understand the population structure of snow algae by examining *Chlainomonas* sp. blooms from the North Cascades sampled both throughout one season and across three years. We will compare the efficacy of microsatellite genotyping with a novel genotyping method for single nucleotide polymorphism (SNPs). We will use statistical analyses, such as Bayesian analyses of genotypic frequencies and summary statistics including *pareto ß*, to understand the clonal rate during *Chlainomonas* blooms. These genetic tools will allow us to document snow algal population dynamics. The poster will also connect snow algae to marine algae, explaining how this research is a foil to similar work done on marine algal population structure, as well as discussing the importance of snow algal research, considering the existential threat snow algae face from climate change and disappearing habitats worldwide.

P12- FUNCTIONAL TRAIT ANALYSIS REVEALS DISTINCT ECOTYPES IN THE MARINE ALGA *ASCOPHYLLUM NODOSUM*. *(Trainor Award Candidate)*

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To understand how species may respond to future environmental conditions, it's important to first consider how they are currently adapted to varying environmental conditions. The space-for-time substitution theory suggests that comparing morphological diversity across different locations can help us infer how species may adapt to future conditions, as current conditions in one place may resemble future conditions in another. By studying these adaptations, we can better predict how species might cope with environmental changes. A major goal in ecology is to identify theories that apply across different ecosystems. To this end, I used the functional trait framework, which originated in terrestrial ecology. Recent advances in this field emphasize the importance of studying multiple traits to understand trade-offs and overall phenotypes. In my field survey, I examined *Ascophyllum nodosum* at three tidal heights across six sites across the Gulf of Maine. I analyzed 10 functional traits from 360 individuals. Preliminary results suggest that northern individuals tend to be taller, less branched, and slimmer while southern individuals are shorter, more branched, and wider. Across tidal heights, the circumference of individuals increases from high to low tide in the northern sites, while in the southern sites, it peaks for mid-intertidal individuals. In conclusion, these findings support a model for measuring trait diversity across multiple spatial scales, helping us understand how species may adapt to environmental changes.

P13 - UNCOVERING CRYPTIC DIVERSITY OF *GRAPHIS SCRIPTA* LICHEN SYMBIONTS REVEALS A SURPRISING PATTERN OF CO-OCCURRENCE *(Trainor Award Candidate)*

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The script lichen, a charismatic lichen symbiosis between the aerophytic green alga *Trentepohlia* (Ulvophyceae) and the ascomycete fungus *Graphis scripta,* is commonly found on smooth bark trees as a white lichen thallus bearing striking black, linear fruiting bodies and an orange photobiont layer of *Trentepohlia* below the surface. *Graphis scripta* is widely distributed across Europe and Eastern North America, including in New England, and was thought to compose a single species. However recent molecular analyses of primarily European samples suggest it may represent a complex of five fungal clades, i.e. putative phylogenetic species. To assess the molecular diversity of *G. scripta* symbionts in New England, we collected 165 specimens of script lichens and free-living *Trentepohlia*. After extracting, amplifying, and sequencing two loci of each symbiont (i.e., algal rbcL and ITS, fungal EF-1 and mtSSU) our analyses identified all five clades of *G. scripta* seen in Europe, while algal data revealed distinct free-living and lichenized *Trentepohlia*. Two of the three lineages of lichenized *Trentepohlia* represent new phylogenetic clades. Most surprising was the strong pattern of co-occurrence between *G. scripta* clades and *Trentepohlia* lineages. This pattern is not explained by environment (ecoregion) or substrate, and represents a strict symbiont specificity rare among green-algal photobionts and their mycobionts.

P14 - WILL *SARGASSUM* BECOME THE DOMINANT CANOPY IN SOUTHERN NEW ENGLAND? *(Trainor Award Candidate)*

Kaleb Boudreaux

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Climate change has directly affected the various species of macroalgae in Southern New England via marine heatwaves. A marine heatwave is a period where the ocean's surface temperature is two or three degrees (Celsius) higher than the average. We will look at two macroalga, *Saccharina latissima* and *Sargassum filipendula*, to see which species dominates the subtidal zone. At 2 sites in Rhode Island, *S. filipendula* and *S. latissima* will be examined around 20 ft for 30 minutes by a Go-pro video recorder which will be analyzed in a lab. Additionally, the height will be measured using a measuring tape. Biodiversity around both macroalgae will be examined using video footage. This process will be repeated throughout the summer and fall of 2024 as well as light and temperature levels. Results will vary by seasonal patterns as *S. latissima* degrades in warmer temperatures and *S. filipendula* will degrade in colder temperatures reducing their overall canopy size. However, because marine heatwaves continue to be more common, we hypothesize that *S. filipendula* will become the new dominant canopy in Southern New England. This study is important because the ecological changes caused by climate change needs to be examined in our oceans for us to understand the new biodiversity that will inhabit southern New England.

Contributed Posters

CP1 - THE MID-ATLANTIC COASTAL MARINE ECOLOGICAL MONITORING PROGRAM AT VIMS EASTERN SHORE LABORATORY, WACHAPREAGUE, VIRGINIA, USA

PG Ross[1], Stacy A. Krueger-Hadfield[1], Darian M. Kelley[1], Richard A Snyder[1]

[1]Virginia Institute of Marine Science Eastern Shore Laboratory

An Ecological Monitoring Program (EMP) has been established at the Virginia Institute of Marine Science Eastern Shore Laboratory (VIMS ESL) for the high salinity coastal environment near Wachapreague, VA. The goals of the initiative are to 1) provide status and trends data to scientists and environmental managers of Virginia's marine resources, 2) provide a scientific context for lab visitors' shorter-term research projects and grant proposals 3) provide material for educators to use in classes, and 4) build capacity in staff expertise and training of students. The EMP includes electronic water quality stations, microbial biofilm growth, characterization of epi-benthic communities in soft sediments and hard substrate reefs (intertidal and subtidal), macroalgal distribution and abundance, and drone imagery of barrier island shorelines and back barrier marshes. Water quality stations provide data online in real time and archived for later use. Weekly biofilm growth provides a sensor of nutrient bioavailability, system level microbial productivity, and microbial diversity. Water quality chlorophyll sensors for phytoplankton and biofilm chlorophyll analyses for benthic microalgae have documented the effects of drought and rain events on the coastal system. With the first five years of this long-term effort completed, we are exploring ways these data can be analyzed to evaluate spatial and temporal trends and relationships to establish a plan for periodic assessment of the Virginia coastal marine environment, and to make the data useful for visiting users of VIMS ESL.

CP2- SPECIES DIVERSITY AND ABUNDANCE OF MARINE MACROALGAE ON ANGUILLA AND DOUBLE SHOT ISLANDS, WASHINGTON COUNTY, MAINE

Jordan Chalfant[1], Glen Mittelhauser[1], Amanda Savoie[2]

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Despite their ecological and commercial importance, the diversity and distribution of seaweed species along Maine's coast remain largely understudied, with significant gaps in the baseline data necessary for effective resource management and monitoring. This study focused on understanding seasonal variations in seaweed abundance and diversity on two small islands in Washington County, Maine. We conducted inventories of seaweed species in the intertidal zones of Anguilla and Double Shot Islands during spring, summer, and fall of 2024. Our study was mainly focused on quantifying seasonal changes in species abundance and distribution at two exposed ledges on Anguilla Island. Over 91 person-hours across 15 trips, we surveyed seaweed cover, stratifying assessments by intertidal zone and habitat. We documented 79 seaweed taxa on Anguilla and 54 on Double Shot, with additional molecular analyses underway to confirm species identifications. Our findings revealed a dynamic seasonal variation in species composition, with certain taxa, such as *Devaleraea ramentacea* and *Palmaria palmata*, exhibiting significant fluctuations. We also identified uncommon and cold-water dependent

species, including *Saccorhiza dermatodea*. Invasive species like *Dasysiphonia japonica* and *Codium fragile* were not present. This inventory provides a baseline for future monitoring efforts and management of Maine's coastal seaweed resources, contributing to both ecological understanding and resource management in the face of environmental and economic changes.

CP3- THE EFFECT OF LIGHT INTENSITY ON THE GROWTH OF CYANOBACTERIA AND CHLOROPHYTES

Catherine Nicolo-Hamblin and Dominique S. Derminio

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Algae are a diverse class of photosynthetic organisms found in aquatic ecosystems worldwide. Due to this diversity, different algal species have varying light intensity requirements for optimal growth, where light levels too high or low can result in algal death. This study tested the hypothesis that cyanobacteria would exhibit greater growth under high-light intensities, whereas chlorophytes would prefer lower light intensities. To evaluate this, three species of cyanobacteria (*Microcystis wesenbergii*, *Microcystis aeruginosa*, and *Pseudoanabaena* spp.) and three species of chlorophytes (*Chlorella vulgaris*, *Chlamydomonas reinhardtii*, and *Oedogonium* spp.) were cultured in Z8 media in replicates and incubated under four different light intensities (approximately 0, 50, 100, and 175 mmol photons m^{-2} s^{-1}) measured with using a Photobio Advanced Quantum light meter at room temperature for approximately four weeks. Growth was assessed by measuring chlorophyll levels Turner Designs Aquafluor Reader Model and manual cell counts. At the end of the 28-day period, results indicated that each species exhibited distinct light preferences, but cyanobacteria had slightly higher tolerance under higher light conditions compared to chlorophytes since cyanobacteria generally preferred the 100 mmol photons m^{-2} s^{-1} light level and chlorophytes generally preferred the 50 mmol photons m^{-2} s^{-1}. These findings contribute to better understanding of algal ecology and may have implications for managing algal blooms in natural systems.

CP4- TOLERANCE TO FREEZING STRESS IN BENTHIC FRESHWATER DIATOMS OF THE *PINNULARIA* GENUS: COMPARISON OF POLAR, ALPINE, AND TEMPERATE STRAINS

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Diatoms are crucial primary producers in alpine and polar freshwaters. While temperate diatoms are sensitive to freezing, polar diatoms, especially the complex of *Pinnularia borealis* species, show more resistance. The tolerance to freezing stress of 11 freshwater benthic strains representing different species of *Pinnularia* (including *Caloneis*) from polar, alpine, and

temperate habitats was compared. As vegetative cells, strains were exposed to freezing temperatures down to −4, −10, −20, −40, −80, and −196°C. Vegetative cells appeared to be sensitive to low freezing temperatures; only "mild" freezing was survived by all strains, and MOST did not survive treatments ≤−10°C. However, individual strain sensitivities appeared to be related to their original habitats. For example, polar and alpine strains better withstood "mild" and "moderate" freezing (−4 and −10°C, respectively), and while temperate strains were significantly affected by the "mild" freezing treatment, polar and alpine strains were not. The −10°C treatment was survived exclusively by polar strains, and only *P. catenaborealis* survived all treatments. Interestingly, it exhibited the lowest survival in the −10°C treatment, potentially implying some metabolic activity at freezing temperatures. Thus, the remarkable tolerance to freezing stress of the *P. borealis* species complex remains unique.

CP5 - *MICROSEIRA WOLLEI* PHOTOSYNTHETIC RATE AND VIABILITY OVER AN ANNUAL CYCLE IN THE TIDAL FRESHWATER POTOMAC RIVER

Hannah Toney[1] and R. Christian Jones[1]

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The benthic cyanobacterium *Microseira wollei* was originally described from New England in the late 1800's. but in the past several decades it has become a nuisance species from eastern Canada to Florida. Recently, it has major inroads into the tidal freshwater portions of the Chesapeake Bay region, presumably fueled by high sediment nutrient concentrations and increased water transparency as phytoplankton have declined. Numerous studies have documented the areal extent of *M. wollei* populations and seasonal biomass patterns, finding that populations in some areas overwinter in mats. However, very little information exists on the relative viability of the species over a seasonal cycle including its photosynthetic capability even in summer. We are measuring photosynthetic rate, pigment composition, organic content, and cell morphology over an annual cycle in the tidal freshwater Potomac River to gain insight into the capabilities of this organism over a seasonal cycle. Preliminary data indicates that photosynthetic rate varies markedly with temperature from summer through winter, but even in winter this organism fixes carbon at an appreciable rate.

CP6 - LIMITING NUTRIENTS FOR FIVE FINGER LAKES ACROSS SUMMER MONTHS

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Microcosm experiments were performed on surface water collected from five Finger Lakes (Keuka, Canandaigua, Owasco, Cayuga, Honeoye) spanning a gradient of nutrient and chlorophyll-a concentrations. For each trial, filtered lake water (0.155 mm nesh) was used to prepare triplicates of four treatments – control (no amendments), phosphorus (P) only, nitrogen (N - nitrate and ammonium) only, and a combination of P and N. The microcosm bags were then

incubated for five days at the water surface of a small pond with solar radiation and temperature measured throughout the period. At the conclusion of the experiment, individual samples were analyzed for Chlorophyll-a using a bbe FluoroProbe in the laboratory. The mesotrophic lakes exhibited serial P limitation across all months while the eutrophic lake showed both co-limitation of N and P and serial N limitation across the months. The lowest nutrient mesotrophic lake also exhibited serial N limitation in late summer. Comparisons of phytoplankton groups as measured by the bbe FluoroProbe across lakes and treatments will be presented as well as relationships with lake nutrient ratios and watershed characteristics.

CP7 - *PYRODINIUM BAHAMENSE* ABUNDANCE IN VIEQUES, PUERTO RICO

Liam Bonner, Caitlin Krauth, Genevieve Dallmeyer-Drennen, Joshua Drew, Hannah Reich

SUNY College of Environmental Science and Forestry, Syracuse, NY 13210 USA

Pyrodinium bahamense var. *bahamanse* is found throughout several bays around Puerto Rico, with the extent of its range unknown. We will determine the abundance of *P. bahamense* in Vieques, focusing on Mosquito Bay and Puerto Fuerro. Additionally, we seek to assess the influence of salinity gradients in bays and rivers to find the optimal habitat conditions. We will conduct field sampling across multiple sites in Vieques, measuring *P. Bahamense* abundance in relation to water temperature and salinity. Water samples will be collected and analyzed for cell density, while in situ measurements of temperature and salinity will be recorded. We expect Mosquito Bay to have a higher abundance of *P. bahamense* will be most abundant in waters above 20°C and 18ppm. Additionally, we expect variations in abundance between bays and riverine environments, reflecting differences in water chemistry and habitat suitability. Understanding the distribution and environmental preferences of *P. bahamense* in Vieques can aid in the understanding of algal blooms and the toxins they produce that can affect other wildlife, and the broader ecological impacts of its presence in the bays.

CP8- LIGHT AND VERTICAL MIGRATION OF CYANOBACTERIA IN A SHALLOW EUTROPHIC LAKE REVISITED

Dominique Derminio[‡a], Zacharias Smith[‡b], Bofan Wei[‡], Matt Hartzheim[‡], Chris Japinga[‡], Kaela Natwora[‡c], and Gregory L. Boyer[‡]

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Microcystis vertically migrates in response to cellular needs for nutrients to optimize their light environment. Samples were collected at 0.5 m intervals from the shallow, hypereutrophic Lake Neatahwanta (Fulton, NY) between the hours of 04:00 and 23:00 under windy (2016) and low-wind (2017) conditions to examine vertical migration of *Microcystis* when nutrients were in excess. Light irradiance, cellular pigments, PSII photosynthetic efficiency (F_v'/F_m'), and cyanotoxins were measured. During the high-wind conditions, there was a nearly homogeneous

distribution of cells throughout the water column. During low wind conditions, the cells moved deeper in the water column during high light. Cells near the surface had a lower photosynthetic yield (~0.15) than deeper cells (~0.3), indicating the surface cells were under high light stress. This movement did not eliminate all light stress. There was no change in chlorophyll-*a* or phycocyanin per cell throughout the day, indicating that cyanobacteria did not photo-acclimate by changing their cellular pigment quota each day. The concentration of particulate microcystins and cellular quota also did not change. These results have important implications for monitoring cyanobacterial events to avoid underestimating cell numbers as cells migrate away from the surface during peak irradiance.

CP9 - AN UPDATE ON "PROTECTING MINNESOTA'S BENEFICIAL MACROALGAE: ALL STONEWORTS AREN'T STARRY."

Victoria D. Davis[1], Donna J. Perleberg[2], Raining A. White[3], Kate A. Hagsten[3], Melinda Neville[4], Paul J. Radomski[2], & Kenneth G. Karol[1]

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Characeae are an ecologically important, understudied family of macroalgae found in freshwater and brackish habitats globally. Due to a lack of training, aquatic surveys often report Characeae only to the genus level. Knowledge of Characeae diversity improves understanding of ecological dynamics and evolutionary patterns in freshwater ecosystems. Characeae are common and abundant, forming the dominate aquatic macrophyte group in many Minnesota lakes. In collaboration, the Minnesota Department of Natural Resources, the New York Botanical Garden, the Leech Lake Tribal College, the Leech Lake Band of Ojibwe Division of Resource Management, and the University of Minnesota Bell Museum surveyed more than 650 lakes throughout Minnesota, documenting charophycean diversity and collecting associated ecological data. Approximately 1,300 collocations were made, most in triplicate, resulting in about 3,900 voucher specimens identified using morphology and DNA sequence data. More than 50 Characeae species were documented, increasing known Minnesota diversity fivefold. Species distribution maps, morphological and phylogenetic diversity along with ongoing taxonomic challenges will be presented. Results from this study will help guide local and regional stakeholders in lake management decisions and serve as a baseline for future studies.

CP10 - MOLECULAR AND TAXONOMIC ASSESSMENT OF RED ALGAL BIODIVERSITY AND INTRODUCED SPECIES ON MASSACHUSETTS' NORTH SHORE

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DNA barcoding is a powerful tool for classifying marine macroalgae and is particularly useful for detecting introduced species that may impact coastal ecosystems. This study combined traditional

taxonomic techniques with DNA barcoding to assess the presence of introduced red algal species at multiple North Shore, Massachusetts locations and one site in Rye, New Hampshire. We identified a diverse assemblage of red algal taxa from intertidal collections made between September and November 2024. Among them, the introduced species *Ceramium secundatum*, *Dasysiphonia japonica*, *Gracilaria vermiculophylla*, and *Melanothamnus japonicus* were confirmed. Notably, *C. secundatum* and *M. japonicus* were detected north of Cape Cod for the first time, extending their known range. These findings highlight the value of molecular identification in detecting cryptic species and monitoring introduced macroalgae. Future studies with expanded sampling efforts could further elucidate ecological impacts and inform conservation strategies.

CP11 - EVALUATION OF AERATION FOR THE MITIGATION OF HABS

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Lake Mohegan, a 103-acre lake in Westchester County, NY, has experienced frequent harmful algal blooms (HABs), many of which have forced its swimming beaches to close. To address this issue, the Mohegan Lake Improvement District installed a lake-wide aeration system in 2023. The goal of this system was to prevent the bottom water from being depleted of dissolved oxygen (DO), which leads to release of nutrients from underlying sediment and, subsequently, HABs. The aeration system's effect on the lake was monitored in 2023 and 2024. A buoy equipped with temperature and DO loggers was deployed in the lake's deepest part to constantly record its thermal structure and the bottom water's DO concentration. Temperature and DO profiles were also collected weekly at eight sites, four deep and four shallow, along with water samples from four sites for visual and algal toxin analysis. Once the aeration system was running constantly, the water column was generally uniformly mixed at all sites. In 2023, only two out of 94 samples had detectable, but low (less than 1 μg/L), levels of microcystins and there were no beach closures due to HABs. However, in 2024, 15 out of 104 samples had detectable levels of microcystins, four of which were greater than 1 μg/L, and there were a few beach closures due to HABs. Although the aeration system seems to have helped reduce HABs, it has not eliminated them completely and only time will tell its continued effectiveness.