

University of New England
College of Arts and Sciences

25TH ANNUAL
SPRING
RESEARCH
SYMPOSIUM



UNIVERSITY OF
NEW ENGLAND
INNOVATION FOR A HEALTHIER PLANET

Friday • May 2, 2025

CONTENTS

Introduction 3

Research at UNE.3

Schedule4

Distinguished Alumni Speaker5

Poster Presentations and Displays. . . . 7

Legend8

Displays9

Posters11

Business Posters64

Oral Presentations. 71

Legend72

Presentations.73

Directory 86

Posters by Author87

Oral Presentation Schedule92

Thank you 93

RESEARCH AT UNE

On behalf of the UNE College of Arts and Sciences (CAS) Dean's Office, welcome to the 2024-25 CAS Spring Research Symposium! This event, now in its 25th year, showcases the scholarly and creative endeavors of our students through works of art, posters, and oral discussions and represents the outcomes of over 200 talented students working under the direction of dedicated faculty and professional staff.

Please join us in celebrating the hard work, enthusiasm, and creativity of our students by learning about their fascinating projects. We hope you enjoy your day!

Amy Keirstead, Ph.D.

*Associate Dean and Associate Professor of Chemistry
College of Arts and Sciences*

SCHEDULE

Friday, May 2, 2025 | 9:30 a.m. – 4 p.m.

9:30 – 11:30 a.m.

Poster Presentations and Displays

Alfond Forum 283 A/B

College of Business Posters

Alfond Forum 281

11:30 a.m. – 12:30 p.m.

Lunch and Distinguished Alumni Speaker

Alfond Forum Blue Court

Wesley B. Renfro, Ph.D.

Dean, College of Arts and Sciences

James D. Herbert, Ph.D.

President, University of New England

Cameron Hodgdon, Ph.D., '17

B.S. Applied Mathematics and Marine Science

Distinguished Alumni Speaker

Amy Keirstead, Ph.D.

Associate Dean, College of Arts and Sciences

1 – 4 p.m.

Undergraduate Oral Presentations

Decary Hall, Rooms 205, 208, and 212

Graduate Oral Presentations

Decary Hall, Room 203

DISTINGUISHED ALUMNI SPEAKER

Cameron Hodgdon, Ph.D., B.S. '17

Cameron Hodgdon, Ph.D., B.S. '17 (Applied Mathematics and Marine Science), is a fish biologist at the Northeast Fisheries Science Center (NEFSC), studying the impacts of climate change on population dynamics and assessment practices. He also serves as the assessment lead on Eastern Gulf of Maine Cod and Southern New England Yellowtail Flounder. Following his bachelor's from UNE, Hodgdon joined the research group of Yong Chen, Ph.D., in the School of Marine Sciences at the University of Maine. As a Ph.D. candidate, his areas of research focus included stock assessment, habitat modeling, population dynamics, environmental forecasting, individual-based simulations, and patterns of species growth for various crustaceans, mollusks, and teleosts. Hodgdon continued his work in these areas as a postdoctoral research associate in Dr. Chen's group at Stony Brook University and has been at the NEFSC, a division of NOAA Fisheries, since 2023. He is the author of 28 publications, has been a Co-PI on four funded grants, and was the UMaine "Three Minute Thesis Competition" winner in 2019.



While a student at UNE, Hodgdon engaged in undergraduate research with James Sulikowski, Ph.D., in Marine Science. His work focused on acoustic telemetry, satellite tracking, diet analysis, habitat usage, and thermal effects on development and behavior of various teleosts and elasmobranchs. Hodgdon was a two-time Summer Undergraduate Research Experience (SURE) Award recipient, including a Maine Space Grant Consortium award, and completed the College of Arts and Sciences Honors Program. Outside of the lab, he served as president of the Math Club for two years and engaged in intramurals. Hodgdon was recognized as the Outstanding Student in Marine Biology in 2017. We are delighted to welcome Cameron Hodgdon back to UNE and CAS as the 2025 Distinguished Alumni Speaker.

POSTER PRESENTATIONS

LEGEND

63. Goat Island Alternative Energy Project

<u>Student Author(s)</u>	Cameron Indeck '22 Pam Morgan, Ph.D.	<u>Faculty Advisor(s)</u>
	ENV 262 Gulf of Maine Field Studies II	<u>Course</u>
<u>Abstract</u>	Goat Island, offshore Kennebunkport, Maine, has had an operating lighthouse since 1833. The lighthouse and buildings are powered by an underwater cable from the mainland, which is leaking electricity into the ocean.	
<u>Funded by</u>	Kennebunkport Conservation Trust and the Gulf of Maine Institute.	

DISPLAYS

D1 Nations and Nationalism

Alexandria Barron '26, Colby N. Bartlett '26, Jaylyn E. Bartolome '26, Connor R. Boisvert '26, Alyssa Canarelli '25, Christopher K. Gottlieb '26, Ben P. Gowell '25, Zachary C. Harvey '25, Rylie G. Hastings '25, Amy S. Hatfield '26, Ryan W. Kuzmich '25, Adam M. Lux '25, Jack B. McKibben '26, Ryan C. Nelson '26, Sarah M. Prokop '26, Zakary A. Ramos '26, Tika M. Rank '26, Kimmy M. Staniar '25, Joe Stanizzi '25, Isabelle Stiver '26 | *Eric G. E. Zuelow, Ph.D.*

HIS 395 What Actually Happened? Nationalism Edition

Nations and nationalism as we know them are quite modern, but they are no less powerful for that. This exhibit explores the story behind their development and potency.

D2 The Beauty of Healing; A Journey Recorded Through Art

Sophia Lanza '26 | *Sarah Gorham, M.F.A., Joe Della Valle, Shelby Peterson*

Using art as a tool for translating what we ourselves cannot articulate, or even understand, is what makes art therapy such a unique and critical discipline. Using myself as a demonstration, I have painted and photographed my way through my own personal healing journey. In doing so I not only visually captured the stages of grief involved in heartbreak, but also managed to unearth things about myself I did not recognize before.

POSTERS

1 The Social Value of Weak Ties in Cultivating Belonging

Danielle McCarthy '26, Alexandra Devlin '26, Bridget Lynch '25, Kelly Hanratty '27 | *Julie Peterson, Ph.D.*

In this study, we used a cross-sectional, correlational design to explore how interactions with weak ties (e.g., strangers or acquaintances) influence feelings of belonging and relationship satisfaction within close relationships, and whether this effect is stronger among avoidantly attached participants.

2 Love Languages, Relationships, and Commitment

Aidan DiBona '26, Celana Joshi '26, Stella Libby '27, Evan Faulkner '26, Hadli Nate '26. | *Julie Peterson, Ph.D.*

PSY 285 Research Methods

In this research study, we used a quasi-experimental design to explore how people's beliefs of love languages are impacted by exposure to scientific evidence against love languages (vs. control information). The goal of this study is to look at whether the belief in love languages changes or stays the same when college students are shown scientific proof of the falsifications of love languages. In this study we are also measuring the participants' commitment and relationship satisfaction.

3 Retention and The Self

Logan (Madison) Render '27, Olivia O'Leary-Curcio '26, Lily Marino '27, Ryleigh Doser '26 | *Julie Peterson, Ph.D.*

PSY 285 Research Methods

This study addresses the relationship between self-esteem, the valence of information (positive vs. negative), and retention. We hypothesized that, among individuals with low self-esteem, negative information will be retained

better than positive information. Among individuals with high self-esteem, we hypothesized that retention does not significantly differ between positive and negative information conditions. We hope this research provides insight into memory bias, leading to further knowledge about the role of self-esteem in negativity bias.

4 **The Impact of Exposure to Images of Pets on Positive Affect Levels in College Athletes with High or Low Levels of Pet Interaction**

Natalia Petersen '27, Lily Lewark '27, Jaylyn Bartolome '26 | *Patricia Long, Ph.D.*

PSY 285 Research Methods

This poster focuses on how exposure to images including pets (or no pets) affects positive affect in athletes with high or low levels of pet interactions. Participants answered questionnaires about pet interactions and were presented with images with or without pets. We expect that athletes with more pet interactions and exposure to pet-related stimuli will have more positive affect compared to those who have fewer interactions and no exposure to pet-related stimuli.

6 **Informed Speciesism: Investigating the Role of Taxonomic Bias in Conservation Ideologies**

Emilee Richards '26, Kensington Jerome '26, Caitlyn Gogan '27, Kristen Leite '27 | *Julie Peterson, Ph.D.*

PSY 285 Research Methods

In this study, we used an experimental design to explore how speciesism influences people's willingness to contribute towards conservation efforts for mammalian versus insect species. We tested this by creating four conditions that differed in their presentation of either species and the

relevant information provided. Through these conditions we investigated the factors that impact people's motivations in taking conservation action, such as taxonomic-related speciesism values and if relevant information could alter this.

7 **Effect of Isolation on Anxiety-like Behaviors in Mice**

Caitlyn Gogan '27, Claire Isabelle '27 | *Abbigail Felix, Jared Zuke, Denise Giuvelis*

Social isolation promotes increased anxiety behaviors. Using mice, we examined the effect of social isolation on anxiety-like behaviors. Mice were group housed or singly housed two weeks prior to testing. General behaviors and anxiety-like behaviors were assessed using an ethogram and elevated plus maze. We hypothesize that isolated mice will demonstrate more anxiety by spending increased time in enclosed arms compared to grouped mice. Housing conditioning influence behavior which is an important consideration in research.

Financial support by NIGMS grant # P30GM145497 (PI: Meng)

8 **The Influence of Animals' Appearance on Reported Importance of Conservation in Individuals with or Without a Positive Relationship with Animals During Childhood**

Eliza Downs '27, Claire Isabelle '27, Rachel Mendez '27 | *Patricia Long, Ph.D.*

PSY 285 Research Methods

The way animals are portrayed in media plays a huge role in conservation initiative support. Children exposed to positive experiences with animals are more likely to care more about them in the future but there has yet to be a link to conservation. Seventy-five undergraduates will be

asked about their relationship to animals in childhood and then view a video of cute animals or non-cute animals. Participants will be asked their thoughts on conservation.

9 DNA Extraction Procedure Influences Northern Bog Lemming (*Mictomys borealis*) Detection

Maya Galpern '25, Grace Hutjens '26, Heather Marvin '25, Rachel Mendez '27 | Cory Stearns, Zach Olson, Ph.D.

The northern bog lemming (*Mictomys borealis*) is a small mammal with an expansive range but is notoriously difficult to capture. To detect the species we developed a non-invasive genetic technique using field collected fecal pellets. Batch collection of samples followed by metabarcoding has the potential to reduce costs, but might increase inhibitory compounds. We report here our tests of two approaches to determine their efficacy in detecting northern bog lemmings.

10 Importance of Blackfish Fishing to Livelihoods, Food Security, and Culture in St. Vincent and the Grenadines

Maya Galpern '25, Jillian Bender '27, Isabella Parks '26 | Michelle Caputo, Ph.D.

St. Vincent and the Grenadines (SVG) is an island nation with an active blackfish fishery. The importance of this fishery remains largely unknown and unquantified. We used interviews with the public, boat-tourism operators, and blackfish fishermen to understand the importance of this fishery and investigate if alternative livelihoods are available in SVG. These results provide the first indication of the cultural and nutritional importance of this fishery to the people and economy of SVG.

11 Modeling *Chrysaora chesapeakei* Biomass and Food Web Dynamics in the United States' Largest Estuary

McKenzie Fitz '25, Maya Galpern '25, Jhana LoRe '25, Hailey Ross '25 | Carrie Byron, Ph.D.

MAR 350 Marine Ecology

The nation's largest estuary, the Chesapeake Bay, is experiencing increased trophic pressure from the pest species Bay Nettle (*Chrysaora chesapeakei*). This study aimed to determine the biomass of the *C. chesapeakei* to identify their impact on the food web dynamics of the Chesapeake Bay. EcoPath was utilized to model the trophic cascade in the Chesapeake Bay influenced by the biomass of Bay Nettles.

12 Measuring Degradation of Marine Plastics Under Turbulent Conditions

Lauren Carrier '25, Royce Engelhard '25, Kelsey Johnson '25, Evan Kamoen '25, Mikayla Straube '25, Abby Tasca '25 | Carrie Byron, Ph.D.

MAR 350 Marine Ecology

The transition to plastic rope materials for marine fishing and aquaculture gear because of their cheap and durable nature introduces synthetic micropollutants known as microplastics to the marine environment through gear degradation. This study aims to quantify the shedding rate of two plastic ropes under turbulent conditions. Knowing the rate that microplastics enter the environment due to marine work could allow for more direct mitigation efforts towards reducing plastic usage in marine environments.

13 Methods Development for Microplastic Extraction in Oysters

Mikayla Straube '25, M.S. '26 | *Carrie Byron, Ph.D.*

Microplastics (<5 mm) are prevalent throughout the global hydrosphere, disruptive to the functionality of organisms, like oysters, important to ecosystem services and the “blue” economy. Though most marine microplastic loading originates from land-based sources, there is question as to whether marine fishing and farming gear contribute directly to microplastic loading in ocean foods. Pioneered digestion, extraction, and visualization methods piloted sequentially towards quantifying ambient loading of microplastics in oysters.

Maine Sea Grant

14 Using Citizen Science to Determine the Distribution of a Rare Salamander, *Hemidactylum scutatum*

Rachel Deren '26 | *Jeffrey Parmelee, Ph.D., Noah Perlut, Ph.D., Will Kochtitzky, Ph.D.*

Four-toed salamanders were thought to be one of Maine's rarest salamanders but in recent years, our knowledge of their distribution has expanded greatly due to the citizen science project Maine Big Night. We analyze this change and discuss future research plans to determine if they in fact have truly expanded their range or if the power of citizen science has given us a valuable tool to track the true distribution of an elusive amphibian species.

15 The Effect of Exposure to Positive Facts About Social Media on Relationship Satisfaction in Students Who Frequently or Infrequently Direct Message on Social Media

Hannah Nowell '27, Carson Da Costa '27,
Kasey Contreras '25 | Patricia Long, Ph.D.

PSY 285 Research Methods

Social media allows people to maintain and strengthen their relationships by providing a place to share experiences virtually; however, media has also been shown to deteriorate long-term relationships. College students will be asked about their usage of the social media direct messaging (DM) feature and will be shown a list of positive facts regarding either social media friendships or in-person friendships. Relationship satisfaction will be examined relative to DM usage and facts viewed.

16 Strategies that Promote Math Perseverance

Megan Spooner '26, Alanna Bradley '26 | Krysten
Gorrivan, M.S.Ed.

EDU 373 Teaching Mathematics, K-8

Through fieldwork and literature reviews, we will observe strategies teachers and students use in improving math perseverance.

National Council of Teachers of Mathematics

17 Fundamental Math Strategies Across Education

Emma Stiles '25, Þóra Stefándóttir | Krysten Gorrivan, M.S.Ed.

EDU 373 Teaching Mathematics, K-8

The fundamental mathematical strategies and rules that remain effective across different educational settings include problem-solving techniques, number sense, logical reasoning,

and foundational concepts such as addition, subtraction, multiplication, and division. These principles provide a consistent framework for understanding mathematics, regardless of the learning environment.

National Council of Teachers of Mathematics

18 Differentiating Curriculum in a Whole Group Setting

Evelynn Silva '26, Daniel Himelfarb '26 | Krysten Gorrivan, M.S.Ed.

EDU 373 Teaching Mathematics, K-8

Inquiry: How do you plan to meet the needs of academically vulnerable students when whole group instruction is required? Our work will include fieldwork observations, the meaning of academically vulnerable students, what teachers do to help reach these students, and compiling academic literature.

National Council of Teachers of Mathematics

19 The Evolution of Self-Love and Self-Worth in Emerging Adults

Alexandra Devlin '26, Danielle McCarthy '26 | Julie Peterson, Ph.D.

This study compares data across the last decade (2010-2024) on feelings of self-love and self-worth among emerging adults. Using a quantitative approach, we examine self-reported self-esteem and self-concept clarity to assess how perceptions of self among college students have evolved, identifying factors that potentially contributed to changes in self-love and self-worth over time.

20 Erosion and Accretion at UNE's Fringing Salt Marsh

Ella Livengood '27 | Pam Morgan, Ph.D.

We used erosion pins and sediment traps to see which areas of the marsh in the cove south of Jordan's Point are most vulnerable to erosion and least likely to keep up with sea level rise. The high marsh at the southwestern part of the site has accreted the least amount of sediment while its edge is eroding at the fastest rate. This information is important because it can help inform our planned restoration efforts.

21 Modality Matters: Exploring the Effects of Reading vs. Listening on Text Comprehension

Sarah Gray '25, Natalie Higgins '28, Trinity Huff '26 | Jennifer Stiegler-Balfour, Ph.D.

This study examines comprehension differences across three modalities: reading, listening, and reading-while-listening (RWL) and ADHD levels among college students. A moderation analysis highlights how ADHD levels moderate the relationship between reading comprehension and presentation mode, suggesting that people with higher ADHD levels benefit from RWL as opposed to reading or listening alone. Our study aims to inform audiobook use in education and help create accessibility for diverse learners.

22 Impact of Reading Medium and Skill Level on Comprehension: Kindle vs. Print

Ella Murthi '27, Jadyn Stevens '27, Mckenzie Kunesh '25 | Jennifer Stiegler-Balfour, Ph.D.

This study examines how reading medium (Kindle vs. print) and individual reading comprehension ability affect comprehension of expository and narrative texts. Four-

hundred and sixty undergraduates completed comprehension tasks and assessments. Results revealed no significant differences in comprehension between mediums, suggesting that Kindles may mitigate the screen inferiority effect. Reading comprehension ability was the strongest predictor of performance, highlighting the critical role of individual skill over medium or text type in comprehension outcomes.

23 How Does the Use of Positive Reinforcement Influence Student Participation in Math Activities?

Katherine Chaisson '27, Quinn Weaver '26 | Krysten Gorrivan, M.S.Ed.

EDU 373 Teaching Mathematics, K-8

This presentation shows the study of exploring the impact of positive reinforcement on student participation during mathematical activities. By analyzing various reinforcement strategies, we examine how encouragement, rewards, and positive feedback enhances engagement and motivation in this subject. Our findings suggest that positive reinforcement fosters a supportive learning environment, which then leads to increased participation and improves mathematical confidence.

24 How Intentional Questioning and Productive Struggle Supports Conceptual Understanding of Mathematical Concepts

Mariah Aikens '26, Shauna Curran '26, Anna Illsley '26 | Krysten Gorrivan, M.S.Ed.

EDU 373 Teaching Mathematics, K-8

Through fieldwork observations, professional interactions, and a literature review, we have investigated the roles of intentional questioning, productive struggle, and extended

wait time in students' understanding of mathematical concepts. The ability to comprehend and retain information is significantly influenced by the methods employed to deliver these concepts. This research summarizes the impact of these strategies on student engagement and their contribution to fostering a deeper, more durable understanding of mathematical principles.

National Council of Teachers of Mathematics

25 Creating Mathematically Engaging Classrooms

Mackenzie Messina '26, Tim Visbeek '26 | Krysten Gorrivan, M.S.Ed.

EDU 373 Teaching Mathematics, K-8

Through fieldwork and literature reviews, we will demonstrate what teacher moves encourage observable positive math behaviors in students.

National Council of Teachers of Mathematics

26 Estimation of Maximum Metabolic Rate of European Rock Shrimp (*Palaemon elegans*)

Caleb Poulin '26, Colby Peters M.S. '25 | Gwangseok Rex Yoon, Ph.D.

MAR 410 Marine Science Research

Maximum metabolic rate is the maximum energy turnover, which sets the theoretical ceiling of aerobic metabolism. We measured whole-body oxygen consumption rate of stressed and non-stressed shrimps across three different temperature regimes to estimate maximum metabolic rate. Stress was given by chasing the animal for 5 minutes based on the literature. Preliminary analysis suggests that there is no significant difference in maximum metabolic rate between temperature treatments and stress ($p > 0.05$).

27 Development of Lactate Dehydrogenase and Citrate Synthase Assay Protocol on European Rock Shrimp (*Palemon elegans*)

Milo Lypps '25, Colby Peters M.S. '25 | Gwangseok Rex Yoon, Ph.D.

Lactate dehydrogenase (LDH) is a glycolytic enzyme that converts pyruvate to lactate, which reduces NAD⁺ to NADH, whereas citrate synthase (CS) is a mitochondrial enzyme that catalyzes the first step of the TCA cycle. Measuring enzyme activity can provide useful insights into understanding the capacity of energy metabolism. We successfully developed a LDH assay protocol by taking an approach of the Michaelis-Menten kinetics based on the literature, while the CS assay protocol is under progress.

28 Long-Term Effects of Bird-Friendly Hayfield Management on Grassland Songbird Populations

Alexa Beyrouty '25 | Noah Perlut, Ph.D.

We used a 23-year dataset to assess population change of two declining species of grassland songbirds, Bobolinks and Savannah Sparrows, breeding in Vermont. We studied three hayfields, two of which were mowed during the breeding season, negatively affecting nest survival rates. Bird-friendly mowing practices were implemented on the two hayed fields after the 5th year, increasing nest survival. We compared bird abundance with regional trends, assessing if bird-friendly management positively affected the local population.

29 Investigation of Temperature Induced Molting in Green Crabs (*Carcinus maenas*)

Milo Lypps '25, Ashley Mason '25, JJ Custer '25, Alexa Beyrouty '25, Kyle Lamarche '25 | Carrie Byron, Ph.D.
Michael 'Mike' Masi

MAR 350 Marine Ecology

Green Crabs (*Carcinus maenas*) exhibit the highest rates of molting at summer temperatures of around 15.5 degrees Celsius. This project aims to determine if molting can be induced in a lab environment by incubating male Green Crabs at 15.5°C for 30 days. It is expected that the incubated crabs will exhibit premolt characteristics whereas crabs kept in a control treatment of ambient sea temperature will not.

30 Determination of Locomotory Behaviors of the European Rock Shrimp

Ashley Mason '26, Colby Peters M.S. '25 | Gwangseok Rex Yoon, Ph.D.

MAR 410 Marine Science Research

As heat waves have become more frequent and intensified, it is important to understand how temperature could influence locomotory behavior of aquatic animals. We examined behavioral effects of heat waves on the intertidal shrimp *Palaemon elegans*. Using an automated tracking program (LoliTrack V5; Loligo Systems, Viborg, Denmark), distanced moved, averaged speed, acceleration and nearest neighbor distance were measured at three thermal regimes. Results will be discussed in the context of environmental resilience of this species.

31 Determining the Preferred Habitat of Northern Bog Lemmings (*Synaptomys borealis*) in Northern Maine

Ashley Mason '26 | Will Kochtitzky, Ph.D.

GIS 162 Applications of Geospatial Science and Technology

Northern Bog Lemmings (*Synaptomys borealis*) are notoriously difficult to locate and study in the field, an issue that is exacerbated by their threatened status in Maine. Using LIDAR data, this project examines vegetation height and density trends at sites with documented lemming presence in order to identify the preferred habitat of Northern Bog Lemmings in Northern Maine. The results of this project are expected to aid in future studies of these animals.

32 Impact of Ambient Salinity on the Reproductive Release of *U. fenestrata*

Maxwell Bleyle '26, Rachel Gardner '25, Em Jareo '25 | Carrie Byron, Ph.D.

U. fenestrata reproductivity was tested in five different salinity treatments (0ppt, 22ppt, 32ppt, 42ppt, 64ppt). *U. fenestrata* was collected from the Biddeford pool area. A deprive release was done for the *U. fenestrata* after six days in each respective salinity condition to quantify the reproductive rate. *U. fenestrata* was seen to have lower reproductive rates in 0ppt and 64ppt conditions. Optimal release salinity is thought to be 32ppt.

33 Comparing Effectiveness of Seawalls Versus Natural Dunes in Preventing Coastline Erosion at Biddeford Pool, ME

Andrew O'Toole '25 | Will Kochtitzky, Ph.D.

GIS 364 Spatial Analysis

In the winter of 2024, Maine was ravaged by back-to-back storms causing immense devastation. Biddeford Pool beach, which contains both a man-made sea wall and naturally occurring dunes in its eastern region, was severely impacted by these storms. By analyzing historical satellite imagery and modern photogrammetry surveys from before and after the winter 2024 storms, we can assess whether the sea wall or the dunes were more effective at mitigating coastal erosions.

34 Habitat Use and Suitability of Cetaceans Off the Seychelles Archipelago, Predicting Impacts of Climate Change

Andrew O'Toole '25 | Michelle Caputo, Ph.D.

GIS 410 GIS Research

The waters surrounding the Seychelles Archipelago are frequented by various species of cetaceans. Based on sighting data and BioOracle marine data layers, we used QGIS and Generalized Additive Modeling in RStudio to identify what environmental factors are primarily influencing species distribution. We developed Habitat Suitability Models for each species using MaxEnt ecological modeling software, visualizing current and future broader habitat range. This can provide insight into how climate change may influence changes in species distribution.

35 Impact of Invasive Green Crabs (*Carcinus maenas*) on the Biodiversity of a Rocky Intertidal

Arianna Ochs '26, Alexandra Guignard '25, Jessica Martin '25, Emma Rose Seger '25 | *Carrie Byron, Ph.D.*

MAR 350 Marine Ecology

Using transect data collected over 7 years at a rocky intertidal in Southern Maine, we measured local biodiversity in relation to green crab abundance. We found that higher biodiversity was correlated with lower populations of green crabs. With the green crab increasing in range as a result of warming temperatures, newly affected regions are expected to see a similar decrease in biodiversity which disrupts local ecosystems and harms economically important species such as mussels.

36 Simulating the Thermostability of a Plastic Degrading Enzyme

Lucas Girard '26 | *John Stubbs, Ph.D.*

CHE 410 Research I

PETase is an enzyme that degrades the plastic polyethylene terephthalate (PET). Although this reaction is more efficient at elevated temperatures, PETase can denature under these conditions, making a thermostable variant desirable. Mutated variants have been developed to function at higher temperatures, however the underlying mechanisms linked to thermostability are not well understood. By carrying out molecular dynamics simulations on the wild-type PETase alongside a thermostable mutant, we seek to understand the factors behind enzyme thermostability.

37 Studies of the On-Water Diels-Alder Reaction with Anthracene: Synthesis, Derivatization, Characterization, and Rate Effects

Sam Spiese '25, Josh Gantert '26, Lucas Girard '26 | Amy Deveau, Ph.D.

CHE 251 University Organic Chemistry II

The hydrophobic effect can have a significant impact on aqueous Diels-Alder Reaction rates. In this study of an “on-water reaction”, anthracene-based Diels-Alder adducts and related derivatives are synthesized. The impact of adduct substituents and reaction conditions on the reaction rate are explored.

38 Adventures in Terpene Synthesis: Green Chemoselective Dehydration of Cis-Terpin Hydrate and Product Derivatization to Yield Structurally Interesting Terpenes

Ashton Wonson '27, Huy Ha '27, Steven Clendenny '27 | Amy Deveau, Ph.D.

CHE 251 University Organic Chemistry II

This study examined how cis-terpin hydrate catalyzed with the green resin catalyst Amberlyst-15 yielded specific terpene products. Resulting derivatization and characterization of the α -Terpineol product was pursued.

39 **Synthesis of Bioactive Coumarin Derivatives: Green Pechmann Condensation, Derivatization and Characterization**

Marisa Crowley '27, Kendra Penrose '25, Kerry Tracey '27 | *Amy Deveau, Ph.D.*

CHE 251 University Organic Chemistry II

The synthesis, characterization and derivatization of bioactive coumarin derivatives will be discussed. Green synthetic methods have been utilized.

40 **Exploring the Impacts of Early Life Stress and Arsenic Exposure on the HPI Axis in a Zebrafish Model**

Williard Swift '25, Tyler McGoldrick '26, Gabriel Stoehr '26 | *Michael Burman, Ph.D.*

Arsenic is commonly found in drinking and well water, with EPA action levels set at 10 ppb. Evidence is emerging that exposure to even this level has lasting effects on stress resilience and mental health. We examined the effects of exposure to 10 ppb arsenic in zebrafish for the first 5 days of life on locomotion and defensive behavior. Further studies combined arsenic exposure with early life stress, testing the hypothesis that the effects are additive.

41 **Wingless Pathway Affects Nociceptive Sensitivity**

Michael Caterina '25, Finn Sclafani '27, Luke Jenkins '26, Trevor Flanagan M.S. '25, Zachary Ahmida '24, Camilla Lattanzi '25, Dawson Turcotte '24, Connor Nowak '24, William Harriman '25, Christine Hale Ph.D. '22 | *Geoffrey Ganter, Ph.D.*

While the wingless/WNT pathway is well-known to control normal development, this project seeks to understand the role it may play in regulating pain sensitivity. Using

the fly model, the expression of various wingless/WNT components was manipulated specifically in the nociceptor, and resulting changes in sensitivity were measured. When expression was reduced, sensitivity was reduced. When expression was increased, sensitivity was increased. Drugs targeting these components may be effective in treating abnormal pain in humans.

National Institute of Neurological Disorders and Stroke R15NS131952

42 **Senseless/Klf7 Contributes to Pain Sensitivity in Flies and Rodents**

Camilla Lattanzi '25, Trevor Flanagan M.S. '25, Finn Sclafani '27 | *Geoffrey Ganter, Ph.D., Lei Lei, Ph.D.*

Expression of the murine transcription factor Klf7 and its fly ortholog Senseless was manipulated. In the fly, RNAi-mediated knockdown of Senseless specifically in the nociceptors rendered larvae significantly hyposensitive to both thermal and mechanical stimuli. However, Senseless manipulation had no apparent effect on the dendritic morphology of the fly nociceptors. In genetically engineered mice in which the Klf7 gene was ablated, a significant loss of sensory neurons and hyposensitivity to noxious stimuli were observed.

National Institute of Neurological Disorders and Stroke: R15NS131952-01

43 **Welfare-Centered Care Protocols for Laboratory Housed Zebrafish (*Danio reiro*)**

Cora Allen '25 | *Brian Greco, Ph.D.*

Managed settings are predictable in non-naturalistic ways. This abnormal predictability adversely influences animal welfare. This project explores novel care protocols designed to make the zebrafish laboratory environment predictable

in more meaningful ways. These include two approaches. First, we test discrete reprovisioning — obscuring the fishes' visual contact with care staff space. Second, the conditioning of clear signaling protocols to announce major events, like feeding and tank cleaning. We also test the combination of these two approaches.

44 **Invisible and Exploited: The Impact of Human Trafficking and Systemic Vulnerabilities in Indigenous Communities**

Cora Allen '25, AnnaMaria Biagi '25, and Grace Trost '27 | *Alicia Peters, Ph.D.*

ANT 312 Human Trafficking

This research examines how systemic vulnerabilities, including jurisdictional confusion, racism, economic instability, and inadequate services, contribute to human trafficking in Indigenous communities. Through analysis of scholarly and governmental sources, the study highlights the deep-rooted impacts of colonialism and systemic neglect. Proposed solutions emphasize Indigenous-led, trauma-informed approaches, legal reforms, and economic empowerment to disrupt cycles of exploitation and promote culturally grounded healing and justice.

45 **Mapping Habitat Preferences of the Northern Bog Lemming in Western Maine**

Grace Trost '27 | *Will Kochtitzky, Ph.D.*

GIS 162 Applications of Geospatial Science and Technology

This research seeks to identify the preferred habitat of the Northern Bog Lemming (*Synaptomys borealis*), a species with limited habitat knowledge and potential conservation concerns. Using lidar technology, the research will assess

vegetation density across different elevation blocks in western Maine. The hypothesis is that Northern Bog Lemmings are more likely to be found in areas with higher vegetation density at lower altitude blocks (0 ft-6 ft).

46 The effect of CELF4 RNA-Binding Protein Expression on Nav1.8 Ion Channels in Pain-sensing Neurons

Caitlyn Mayo '26 | Benjamin Harrison, Ph.D., Madison Mueth

CELF4 is an RNA-binding protein enriched in nociceptors and is hypothesized to negatively regulate pro-nociceptive ion channels such as Nav1.8. To examine this regulatory role, CELF4 knockout (KO) and wild-type dorsal root ganglia (DRG) were collected and processed for immunohistochemistry and fluorescence microscopy to determine if loss of CELF4 increases Nav1.8 expression. These analyses will provide insight into the role of CELF4 in nociceptor excitability and pain signaling.

Kahn Family Foundation

47 Effect of Energy Surge on Mouse Locomotive Function and Blood Glucose Level

Caitlin Miguel '27, Sydney Jenisch '27, Caitlyn Mayo '26, Keelin Lienkamp '28 | Jared Zuke, Abbigail Felix, Denise Giuvelis

Different energy sources can trigger physical and emotional responses via various metabolic pathways. Mice were treated with either glucose, caffeine, saline, or no injection. Following treatment, behavior was observed, and the level of locomotor activity was scored. Blood glucose levels were measured 30-minutes post-treatment. We hypothesize that caffeine and glucose treatments will elevate blood glucose

and locomotor activity compared to control mice. This study contributes to understanding how caffeine and glucose individually impact energy regulation.

Financial support by NIGMS grant #P30GM145497, PI-Meng

48 Effect of Caffeine on Anxiety

Mariyalee Delgado '27, Babia Prakash '26, Gavin Gillilan '27 | Abbigail Felix, Jared Zuke, Denise Giuvelis

Caffeine has been shown to increase risk-taking, dose-dependently, in humans. This conflicts with an increase of anxiety-like behaviors in rodents. Our study injected various doses of caffeine or saline and measured anxiety via elevated plus-maze and social interaction assay. We predict that the higher the dose, the greater time spent in closed arms and less social interactions. The results of this study will inform us of the effect of caffeine on anxiety-like behaviors in mice.

NIGMS grant #P30GM145497, PI-Meng

49 Characterization of a Humanized Mouse Model of Alzheimer Disease Susceptibility

Jayden Lovely '25 | Benjamin J. Harrison, Ph.D. Lindsey Avery Fitzsimons, Ph.D., RCEP/CES

We characterize a new mouse model of Alzheimer Disease (AD) susceptibility in collaboration with Gareth Howell's group at JAX labs. We hypothesize mice with a humanized CD2AP gene variant will have reduced expression of CD2AP protein in basal forebrain cholinergic neurons. We will test this hypothesis by quantifying immunofluorescent CD2AP signals from sections of aged mouse basal forebrain from these mice. These studies could uncover novel mechanisms of AD pathophysiology.

Kahn Family Foundation

50 Impacts of Agricultural Development on the Grasslands on the Midwestern United States

Robin Gorham '25 | Zach Miller-Hope, M.S.

GIS 162 Applications of Geospatial Science and Technology

Historically, the midwestern United States has suffered significant losses of grassland ecosystems and the biodiversity that thrived in these ecosystems. The tallgrass prairie ecosystem is now endangered and 4% of its original size. This project looks at the development of industrial agriculture of prominent crops, soybeans and corn. Changes are displayed using data from 2006 to the present, overlaid with historical grasslands maps, and the ranges of important animals that have relied on these grasslands.

51 Land Use Change and Urban Sprawl in Concord, NH

Madelyn Houston '26 | Zach Miller-Hope, M.S.

GIS 162 Applications of Geospatial Science and Technology

Population growth in Concord, NH is increasing exponentially. With this growth, urban sprawl is increasing causing land use change, deforestation, pollution, infrastructure changes, and an overall uptake in development. The purpose of this lab was to explore how these factors interact and map these changes over time.

52 Vanishing Wetlands: Monitoring Erosion Over Time

Jacob Ford '25 | Zach Miller-Hope, M.S.

GIS 162 Applications of Geospatial Science and Technology

This project observes changes in wetlands by using satellite imagery to monitor erosion patterns.

53 Movement Potential of PFAS Based on Location of Initial Contamination Site in the Penobscot River Watershed

Daniel Gallagher '26 | Zach Miller-Hope, M.S.

GIS 162 Applications of Geospatial Science and Technology

Per- and polyfluoroalkyl substances (PFAS) are common, long-lasting contaminants used widely in consumer products that present several health risks to humans. These chemicals have been found in drinking water wells used by high schools in Maine (Sosa et al. 2019). Movement within the watershed can happen via a few pathways that can be modeled (Rafiei and Nejadhashemi 2023). Understanding the movement patterns of PFAS can be useful for reducing the risk of contamination.

54 Can Lidar be Used to Analyze Chestnut Trees in Small Orchards

Bailey Gosse '26 | Zach Miller-Hope, M.S., Will Kochtitzky, Ph.D., Thomas Klak, Ph.D.

GIS 162 Applications of Geospatial Science and Technology

The Sprague Conservation Area at Ram Island Farm contains genetically modified American chestnut trees (*Castanea dentata*) designed to resist a destructive fungus (*Cryphonectria parasitica*) and bring back the once prominent tree from extinction. By analyzing tree height and biomass with drone-collected lidar and comparing it to hand measurements, the project aims to evaluate genetic variations for growth performance and develop accurate remote sensing methods for monitoring tree health and survival.

55 Wet or Dry? Exploring the Dynamics of Ocean, Lake, and Land Terminating Glaciers

Katelyn DeWater '25 | Will Kochtitzky, Ph.D.

GIS 410 GIS Research

Globally, glaciers are melting due to climate change, contributing to rising sea levels. Glaciers can be classified based on their terminus type, which refers to the environment at their edge: terrestrial (land), marine (ocean), or lake terminating. Each terminus type experiences different environmental conditions, influencing the rate of glacial retreat. Using GIS, we measure the velocity and elevation change of a global dataset of glaciers to understand how their terminus type affects their dynamics.

56 Visibility and Factors Perpetuating Migrant Labor Trafficking in New England's Agricultural and Seafood Industries

Magdalene Meek '25, Sophie Martin '25 | Alicia Peters, Ph.D.

ANT 312 Human Trafficking

Known for its scenic views, local amenities and agricultural commodities, New England provides us with many wonderful things. This often makes the task of recognizing human trafficking in action all the more difficult. We take a deeper dive into the labor trafficking issues surrounding harvesting and consumption of produce within the region, in hopes of spreading awareness on an important issue affecting New England and how we can take effective actions to combat human trafficking.

57 Risk and Resilience in First-Generation College Students: A Pilot Study

Eva Fortier '26, Magdalene Meek '25 | *Ashley Shaw, Ph.D.*

Research suggests that first-generation college students are at higher risk for anxiety, depression, and lower sense of belongingness. The focus of this pilot study is to describe first-generation students' levels of risk (e.g., depression) and resilience (e.g., belonging) using four validated measures. We also compared mean scores on these measures to college students' from previous studies to ascertain whether first-generation students differ from the general college population on these symptoms and resilience factors.

58 Comparison of Bacterial Binding to Different Types of Microplastics

Caroline Fales '25 | *Kristin Burkholder, Ph.D.*

Ocean microplastics are substrates for bacterial attachment. If ingested by marine organisms, microplastics may facilitate pathogen entry into the human food supply. No studies have examined whether microplastics transport microbes into marine species consumed by humans. In preparation for a study aimed at examining microplastic-mediated bacterial transport into oysters, we compared the binding of bacterial strains to polyethylene terephthalate, polypropylene and low-density polyethylene microfibers. This will inform future efforts to study microplastics as pathogen vectors.

59 Antimicrobial Compounds from the Thallus and Reproductive Parts of the Seaweed *Fucus vesiculosus*

Mackenzie Beauvais '26, Ethan Case '28 | Ursula Roese, Ph.D.
BIO 410 Biological Sciences Research

We collected brown algae of the species *Fucus vesiculosus* in Biddeford Pool on the coast of Maine. We are comparing extracts from the thallus of *Fucus vesiculosus* to extracts from reproductive organs. In disk diffusion assays, we are currently determining their antimicrobial potential against several human pathogens of *Staphylococcus spa*.

60 Physiological Effects of Tactile and Olfactory Exposure to Soil on Anxiety

Samantha Quatrano '28, Ashlyn Bouchard '27,
Ginika Onyemelukwe '25 | Ursula S.R. Roese, Ph.D.,
David A. Sandmire, M.D.

BIO 210 Introduction to Biological Research

This study will investigate the physiological effects of tactile and olfactory exposure to soil on anxiety. Initial testing among researchers has worked to refine measurement techniques and protocols that include heart rate variability (HRV) and self-reported feelings of anxiety before and after soil exposure. Preliminary tests have suggested that the use of HRV is a reasonable means to measure feelings of anxiety while remaining non-invasive.

61 What Role International Sporting Events (e.g., the Olympics, World Cup) Play in Increasing Trafficking Risks

Valerie Capeless '25, Peter Hennessy '25, Morgan Diefenbach '25 | *Alicia Peters, Ph.D.*

ANT 312 Human Trafficking

Large sporting events such as the Olympics, the FIFA World Cup, and the Super Bowl attract large crowds that increase vulnerabilities to human trafficking for both forced labor and sexual exploitation. This research analyzes patterns of trafficking and evaluates the effectiveness of anti-trafficking interventions during these international events. The research also explores the role of government policies and public awareness campaigns in mitigating these risks.

62 Barriers to Justice: How the Fear of Deportation and Criminalization Can Silence Trafficking Victims

Lily Ann Noon '25, Keely Kasputis '25, Mary McMaster '26 | *Alicia Peters, Ph.D.*

ANT 312 Human Trafficking

Human Trafficking victims face a wide variety of barriers that limit their ability to escape and move forward from trafficking. Through our project, we explored the ways in which victims can be criminalized, worsening their ability to escape their trafficking situations. Similarly, trafficking victims from outside the country can face the threat or action of deportation. Overall, we looked at how traffickers exploit immigration status and legal vulnerabilities to control and limit their victims.

63 How do Vigilante Justice Approaches Inform Responses to Human Trafficking

Kayleigh Gilbert '25, Casey Haverty '25, Kimberly Staniar '25 | *Alicia Peters, Ph.D.*

ANT 312 Human Trafficking

This poster will introduce vigilante justice as a whole while exploring different types and how they may be used to combat the TVPA definition of human trafficking. We will discuss the history behind vigilante justice as well as doing a deeper dive into Operation Underground Railroad which is a NGO that focuses specifically on using its resources to rescue victims in all areas of the world. We will also explore data on how the public responds to acts of vigilante justice and how these things could inform other more official legal responses to human trafficking.

64 What Resources are Utilized in Current Training to Educate Emergency Department Providers on the Identification of Human Trafficking

Erin Mazurkiewicz '25, Gracie Farnum '25, Aidan Fontaine '25 | *Alicia Peters, Ph.D.*

ANT 312 Human Trafficking

Human Trafficking has been around for decades, but we still can't come up with a solution to decrease the incidence and mortality associated with it. One important place to begin is to look at the training of emergency department staff as victims report needing medical attention at least once during their trafficking experience. By looking into training that has or has not worked, the hope is to spread awareness about systems that do work for identifying victims and implementing them throughout the nation or world.

65 Education and Intervention: Human Trafficking In a Prehospital Setting

Ethan Burke '25, Alexander Duthaler '25, Ella Green '25 | *Alicia Peters, Ph.D.*

ANT 312 Human Trafficking

Human trafficking cases may go unrecognized in healthcare settings due to misconceptions and lack of education on the subject. Pre-hospital providers may be the first or only point of contact with a victim. To provide the best possible care, first responders need resources to identify instances of trafficking and associated warning signs. By reviewing previous cases, different types of trafficking, and the legal definition, providers can obtain the proper skills to manage these situations.

66 Education and Innovation Through Next Generation Aquaponics

Maddy Steen '25, Emma Catling '25, Anna Evans '25, Dylan O'Hagen '25, Ryan Garrant '25, Cloey Parlapiano '25, Ethan Burke '25, Olivia Ellis '25, Natalie Borzi '26 | *Jeri Fox, Ph.D.*

MAR 399 Special Projects in Aquaculture, Aquarium Science or Aquaponics

Educating the next generation in aquaponics is key to advancing sustainable food production. By integrating ecosystem ecology and wetland conservation, innovative seawater and freshwater aquaponic systems can enhance resource efficiency. Biofloc technology further optimizes these systems by recycling nutrients, reducing waste, and supporting microbial communities that improve water quality. Mimicking natural ecosystems, these systems promote biodiversity while producing food sustainably. This approach advances conservation efforts and fosters innovative solutions for future food security.

67 Effects of Substrate Composition on Eelgrass Growth

Maddy Steen '25, Tyler Ellwanger '25, Robyn Rollo '25,
Ryan Garrant '25, Sawher Ohman '25 | *Carrie Byron, Ph.D.*

MAR 350 Marine Ecology

Eelgrass is a foundational species serving as a nursery habitat to marine species. In recent decades their abundance has decreased significantly. MycoBouys, being composed of mushrooms, were invented to cut down on plastics in the fisheries. This study looked at using MycoBouys as an alternative substrate to house and grow eelgrass with potential for conservation and replanting beds.

68 Exploring a Historic Black Settlement in Kennebunk, Maine Using Lidar Technology

Marissa Carter '25 | *Arthur Anderson, Ph.D.,
Will Kochtitzky, Ph.D.*

GIS 410 GIS Research

Through working with the Maine Historic Preservation Commission, lidar data was processed to explore and provide new insights into the landscape around an 18th and 19th century free Black settlement in Kennebunk, Maine.

69 Assessing Remote Sensing Techniques for Archaeological Site Detection at UNE

Marissa Carter '25 | *Will Kochtitzky, Ph.D., Arthur
Anderson Ph.D.*

GIS 162 Applications of Geospatial Science and Technology

Utilizing advanced remote sensing techniques, this project seeks to enhance archaeological site detection on UNE's campus. By integrating historical excavation data with lidar, thermal imaging, and NDVI analysis, a comprehensive site

model will be developed. This research will evaluate the effectiveness of these tools in identifying buried structures and informing future excavation and land-use decisions.

70 Leaf Coverage in Acadia National Park

Regina Dyer '26 | Will Kochtitzky, Ph.D.

GIS 162 Applications of Geospatial Science and Technology

Leaf out is the process in which trees and plants produce new leafs, showing the beginning of a new season. This project examines the changing leaf out patterns in Acadia National Park over the last decade using satellite imagery and NDVI analysis. Using satellite data from “Planet Labs” (2015, 2019, 2024), I will quantify vegetations changes and assess climate changes role in delayed leaf out.

These findings will highlight environmental changes in our National Parks and the economic implications for Mount Desert Island tourism.

71 The Maine Owl Pellet Project

Heather Marvin '26, Rachel Mendez '27 | Zach Olson, Ph.D.

The Maine Owl Pellet Project, a collaboration between the University of New England, Maine Department of Inland Fisheries and Wildlife (MDIFW), and the United States Fish and Wildlife Service (USFWS), engaged the public in crowdsourced science to better understand the diet of Maine’s owls. Here we report on findings from the first two years of the project.

72 Occurrence of Small Cetaceans in Mozambiquan Waters Using Spatial Distribution Models

Kara Mickiewicz '27 | Michelle Caputo, Ph.D.

This study examines small cetacean occurrence in Mozambiquan waters through spatial distribution models. Through the integration of environmental factors such as pH, salinity, and temperature with sighting data, hotspot maps will be created to identify areas of high occurrence. The findings of this study will provide insight on the ecological preferences of small cetaceans, benefitting conservation strategies for species in Mozambiquan waters.

73 Under the Shell of the American Lobster (*Homarus americanus*)

Ruby Motulsky '25 | Markus Frederich, Ph.D.

This project aims to create a comprehensive histological atlas of early development stages of the American lobster (*Homarus americanus*). The atlas will focus on the proportion and growth of internal organs from embryotic to Stage 4 lobsters. Using histological techniques and optimized Hematoxylin and Eosin staining; an enhanced visualization of cellular and tissue structures provides critical insights into the internal morphological changes of the American Lobster.

[BioME, National Science Foundation](#)

74 Understanding the Coloration in Rare American Lobsters, *Homarus americanus*, Stages I-V

Claire Fecteau-Volk '26, Ruby Motulsky '25 | Markus Frederich, Ph.D.

Shell coloration in the American lobster, *Homarus americanus*, is caused by the interactions between the pigment astaxanthin and protein crustacyanin. Understanding rare coloration

includes studying crustacyanin gene expression. UNE has a diverse group of blue, split, calico, yellow, orange, and purple lobsters, plus blue and orange juveniles. Through analyzing the gene expression of crustacyanin subunits throughout the earliest life stages, we hope to enhance our understanding of how these rare colors occur.

75 Using Machine Learning to Quantify Indicators of Decline, Resilience, and Revival in Coral Reef Ecosystems

Mason Gorrondona '27, Tristan Taranto '25, Isabelle Stiver '26, Hanna Bjerkness '27, Jackson Martine '27 | *Jeri Fox, Ph.D.*

Understanding the stressors coral reefs face is increasingly critical as the ocean's climate continues to change. Individual indicators of decline and resilience in coral ecosystems such as algal coverage, fluorescence, environmental parameters, and biodiversity are well researched. However, little is understood about how their combined impacts indicate whether or not a reef will recover. We aim to identify indicators that a coral reef ecosystem will revive and experiment with methods of quantification using machine learning.

76 Quantifying Coral Fluorescence as an Early Indicator of Thermal Stress on the Mesoamerican Barrier Reef (Belize)

Elizabeth Tracy '26, Katelyn DeWater '25, Clayton Nyiri '25, Ethan Burke '25, Mason Gorrondona '27, Tyler Janik '27, Johanna Bircham '26, Tristan Taranto '25, Jackson Martine '27, Isabelle Stiver '26, Hanna Bjerkness '27 | *Jeri Fox, Ph.D.*

As the climate changes, corals are increasingly susceptible to bleaching, disease, and mortality. It has been suggested that corals with a greater percentage of fluorescing tissue and a variety of fluorescence proteins are more resilient to

thermal stress. In this study, we quantified the percentage of fluorescing tissue of great star coral (*Montastrea cavernosa*) from images collected on Belize reefs. We aim to document changes of fluorescence in the same coral individuals over time.

77 **Changes in Vegetation Health in Maine Using Remote Sensing**

Tyler Janik '27 | Zach Miller-Hope, M.S.

GIS 162 Applications of Geospatial Science and Technology

I use the Normalized Difference Vegetation Index (NDVI) from the USGS eVIIRS to quantify changes in vegetation health over the past decade in the state of Maine.

78 **Monitoring the Water Quality of a Recirculating Aquaculture System at the GMSC**

Elizabeth Tracy '26 | Gwangseok Rex Yoon, Ph.D., Mike Galloway, M.S.

Nitrogenous waste management is crucial in the development and management of aquaculture systems. Through the process of nitrification, toxic ammonia (NH_3) is converted to non-toxic nitrate (NO_3^-) via bacteria growth. Water quality was monitored within the recirculating aquaculture system's biofilter, using colorimetric spectrophotometry, following the pre-seeding of ammonium chloride (NH_4Cl) to track bacterial growth and development. Results will be discussed in the context of the toxicity of ammonia in organisms from finfish aquaculture.

79 Effect of Antimicrobial Peptides on Antibiotic Susceptibility of *Staphylococcal* biofilms

Caycie Carrozzo '25, Koby LaRose '25, Paige DeVries '25, Alya Theriault M.S. '25 | *Kristin Burkholder, Ph.D.*

Staphylococcus aureus causes serious and sometimes fatal biofilm-associated infections. Biofilms are resistant to antibiotic treatment, and therefore novel anti-staphylococcal therapeutics are needed. Here, we used biofilm-killing assays and biofilm integrity assays to test the effect of antimicrobial peptides on the susceptibility of biofilm-resident *S. aureus* to the antibiotic vancomycin. Our data suggest potential utility of AMPs in enhancing antibiotic efficacy against *S. aureus* biofilms.

UNE Faculty Minigrant to K.M. Burkholder

80 Effect of Chemogenetic Inhibition of Neurons in the Parabrachial Nucleus on Corneal Pain Behaviors

Jatan Desai '25 | *Ian Meng, Ph.D.*

Designer receptors exclusively activated by designer drugs (DREADDs) approach was used to inhibit neurons in the parabrachial nucleus (PBN). Adeno-associated virus was injected into the PBN of Sun1; Fos(TRAP2) knock-in mice to express the inhibitory DREADD hM4D(Gi). Three weeks after injections, mice were treated with either the designer drug clozapine N-oxide or vehicle and administered hypertonic saline to the cornea before being placed in BlackBox for behavioral assessment.

Kahn Family Foundation

81 Using a Linear Regression Model to Predict Temperature and Salinity in a Coastal Environment

Josephine Pikowski '26 | *Charles Tilburg, Ph.D.*

In estuarine environments, temperature and salinity are crucial for understanding water circulation. From 2021 to 2023, salinity, temperature, and environmental DNA (eDNA) were collected around Ram Island in Saco Bay. Integrating this data with sea level, northward and eastward wind components, and freshwater discharge, a linear regression model was developed to predict salinity and temperature measurements. This model provides insight into which of the key predictors are influencing the current flow field and water parameters.

82 From Shipboard to Satellite: Comparison of Ocean Color Data

Josephine Pikowski '26 | *Sunny Pinkham, Catherine Mitchell, Ph.D.*

Remote sensing reflectance (R_{rs}) is a fundamental measurement in the study of ocean color. R_{rs} is the ratio of water-leaving radiance to the downwelling solar irradiance providing insight into materials present in the water, such as phytoplankton. This study utilizes data from shipboard field measurements matched to satellite overpasses. By comparing the accuracy of these measurements, a quality control threshold was established, enabling us to identify high-quality data for estimating properties like primary productivity.

83 Elevation Profiles in Goose Rocks Beach Over the Last 23 Years: Changes Through Storms and Restoration

Ruth Ellis '25 | Will Kochtitzky, Ph.D.

GIS 364 Spatial Analysis

Goose Rocks Beach in Kennebunkport, ME is a dynamic location for coastal change. The two devastating storms of January 2024 eroded much of the sand dunes in the northeastern portion of the beach. A restoration project, headed by the Kennebunkport Conservation Trust, occurred in March 2024 to rebuild the damaged dunes. This project analyzes profile elevation data over the last 23 years to quantify long-term trends and evaluate the success of the restoration project.

84 Impacts of Sea Level Rise on the Valuation of Property in Saco, ME

Bryan Corvelo '27 | Will Kochtitzky, Ph.D.,
Zach Miller-Hope, M.S.

GIS 162 Applications of Geospatial Science and Technology

The project will analyze the estimated change in property value of parcels and buildings in Saco using publicly available data, lidar data from UNE's lidar drone, and QGIS.

[Maine Outdoor Heritage Fund](#)

85 Erosion of Coastal Beaches and Dunes During the Highest Water Level on Record in Southern Maine, USA

Katelyn DeWater '25, Matthew Pittsley '24, Johanna Birchem '26, Ruth Ellis '26, Tyler Janik '27, Paige-Marie Merrill '24, Bryan Corvelo '27 | *Will Kochtitzky, Ph.D.*

On January 10-13, 2024, Maine recorded its highest water level during two consecutive severe storms. Using drone photogrammetry, we surveyed beaches in Saco, Biddeford, and Kennebunkport and found a 28% loss of dune area. By the end of the growing season, only 10-50% of dune volume had recovered across the four shorelines. With no net recovery, restoration efforts, which are ~90% more effective at volume recovery than doing nothing, are needed for future dune stability.

Maine Space Grant Consortium and Maine Outdoor Heritage Fund

86 Analysis of Post Storm Dune Recovery and Restorative Efforts from February 2024 to April 2025 in Southern Maine, USA

Johanna Birchem '26 | *Will Kochtitzky, Ph.D.*

GIS 410 GIS Research

From February 2024 to April 2025, drone imagery was used to assess post-storm dune recovery and restoration projects in Maine following record-breaking sea levels during winter storms. Our analysis revealed that dunes partially regained lost sand, with restoration efforts such as beach scraping and dune grass planting significantly aiding recovery. Hardened seawalls sustained greater initial damage but regained more sand over time. These findings show the importance of restoration to maintain dune integrity and resilience.

87 Assessing PFAS Contamination Risks to Atlantic Salmon in Maine: A Spatial Analysis

Johanna Birchem '26 | Will Kochtitzky, Ph.D.

GIS 162 Applications of Geospatial Science and Technology

I will analyze the relationship between Atlantic Salmon population locations and PFAS sites in Maine to identify which PFAS sites pose the highest risk to salmon-bearing rivers. My research builds on studies that examine PFAS bioaccumulation in fish and its persistence in aquatic environments. Using Maine DEP PFAS data, fisheries records, and ArcGIS mapping, I will spatially assess contamination risks. Expected outcomes include a ranked list of high-risk rivers and an action plan for mitigating PFAS impact.

88 Species Distribution Modeling for *Carcinus maenas* Within the Gulf of Maine: A QGIS-based Analysis

Tristan Taranto '25 | Will Kochtitzky, Ph.D.

GIS 162 Applications of Geospatial Science and Technology

The Green Shore Crab has invaded regions such as the Gulf of Maine, leading to serious ecological disruption. As climate change raises global temperatures, the crab's range is likely to expand, threatening the Gulf's marine ecosystems. This proposal aims to create a habitat sustainability index to forecast potential areas for Green Crab proliferation in the Gulf of Maine under various climate scenarios.

89 Updating Coral Lab Photogrammetry Techniques to Facilitate ReefShape Processing

Tristan Taranto '25 | Jeri Fox, Ph.D.

MAR 399 Special Projects in Aquaculture, Aquarium Science or Aquaponics

Effective communication between data processing and collection teams is essential for high-quality research. This semester, I aimed to update photogrammetry techniques in the Coral Lab at the University of New England (UNE) by integrating Will Greene's sampling techniques. By following his procedures and utilizing the ReefShape program, we can streamline our data processing to quickly create accurate 3D models of corals. This integration will improve our research capabilities and support coral conservation efforts.

90 Results of Urban Damage Due to the Palisades Fire in the Los Angeles County

Jack Hooker '25 | Will Kochtitzky, Ph.D.

GIS 162 Applications of Geospatial Science and Technology

In January, 2025 the Palisades fire in Los Angeles burned ~23,707 acres. The intensity of this fire was mainly driven by the Santa Ana winds, drought, and climate change. This study will use lidar data to assess the before and after of the urban areas that were affected by the fire. This will allow better understanding of the damage that had occurred, and the community affected due to this devastating fire.

91 Optimizing Wind Turbine Sites in Maine: Balancing Renewable Energy Goals with Ecological and Community Safeguards

Liberty Crow '26 | Will Kochtitzky, Ph.D.

GIS 162 Applications of Geospatial Science and Technology

Maine's optimal wind turbine sites are concentrated in coastal zones and elevated inland areas. ERA5-Land reanalysis (1950–present) and buoy measurements indicate shifting wind patterns, including altered seasonal gusts and warming-driven disruptions to land-sea temperature gradients (wind energy in Maine). Transmission limitations and community opposition further restrict onshore development (DeWan, T). This analysis integrates wind data, conservation layers, current wind farm locations, and grid connectivity to balance Maine's renewable goals with ecological and community safeguards.

92 PFAS Contamination and Land-Usage in Maine

Annika Doeppers '25 | Will Kochtitzky, Ph.D.

GIS 162 Applications of Geospatial Science and Technology

Polyfluoroalkyl substances (PFAS) are persistent environmental contaminants found in water, soil, and seafood due to their widespread use in consumer and industrial products. This study aims to use high-resolution land cover data for the state of Maine and GIS techniques to assess the relationship between PFAS contamination zones and land-use. The findings can be used to inform future environmental regulations surrounding PFAS contamination by better identifying major sources and potential future at-risk areas.

93 PFAS (“Forever Chemicals”) Abundance in Local Maine Watersheds

Nicholas McGovern '25 | Will Kochtitzky, Ph.D.

GIS 162 Applications of Geospatial Science and Technology

PFAS, or forever chemicals, are manmade chemicals which stick around in the environment for a long period of time. PFAS chemicals are carcinogenic and can cause many negative health impacts due to long term exposure. PFAS chemicals have been found in many Maine watersheds and groundwater. This project quantified the amount of PFAS chemicals present in local Maine watersheds and showed areas which may have potential health impacts due to PFAS concentration

94 Using UAV Thermal Imagery of UNE’s Biddeford Campus to Identify Leakage Points

Erik Swenson '26 | Will Kochtitzky, Ph.D.

GIS 162 Applications of Geospatial Science and Technology

This project aims to identify thermal leakage areas on the UNE Biddeford campus using UAV-based thermal imaging. A DJI Mavic 3T drone will survey buildings to detect heat loss, complemented by ground-level thermal imaging. The data will be processed using Agisoft Metashape to map leakage points and to help recommend potential mitigation strategies. Results are expected to highlight energy inefficiencies, particularly in residential halls and subterranean pipes, helping reduce energy costs and environmental impact.

95 Exploring Changes in Temperature and Salinity in the Gulf of Maine

Olivia Leighton '27 | *Charles Tilburg, Ph.D.*

This project examines temperature and salinity variations within the water column from observations collected at two different locations in the Gulf of Maine. Using MATLAB, temporal variations in temperatures and salinity with depth were analyzed by generating contour plots to visualize and compare patterns in both shallow and deep water basins.

96 Investigating the Impact of Heat Waves on Coastal and Marine Resources Using *In Situ* and Remotely Sensed Data

Emma Christopher '25, M.S. '26 | *Michelle Caputo, Ph.D., Zach Miller-Hope, M.S., Will Kochtitzky, Ph.D.*

This study will investigate the impacts of marine heat waves (MHWs) on key vertebrate and invertebrate species in the rapidly warming Gulf of Maine. Using temperature sensors, satellite data, and historical records, we will assess short- and long-term responses. This project will provide critical baseline data to enhance predictive power for monitoring the impacts of MHW events. Findings will support conservation efforts and guide mitigation measures to protect key marine species in this region.

Maine Space Grant Consortium

97 Determining Seawater Temperature Changes in Saco Bay

Lillian Westerberg '27 | *Patricia Thibodeau, Ph.D.*

The Northeast US Continental shelf has experienced substantial warming throughout the water column in

recent years leading to species range shifts. These warming temperatures strengthen seasonal stratification, including in the Gulf of Maine (GOM). This project seeks to analyze temperature data collected weekly from a conductivity temperature depth sensor in Saco Bay, GOM between May 2024 and April 2025 to determine seasonal shifts in seawater temperature throughout the water column.

Maine Space Grant Consortium

98

Life History of Copepod, *Eurytemora affinis*, in Saco Bay: Current Population Dynamics and Future Molecular Investigations

Piper E. Stagg '27 | Patricia Thibodeau, Ph.D.

Eurytemora affinis (Pope, 1880) is an estuarine egg-bearing copepod native to Saco Bay. Plankton tows collected weekly revealed that *E. affinis* was most abundant in the summer and least abundant in the winter. Preliminary analysis of developmental data indicates egg-bearing *E. affinis* females were present in the summer, as well as in the fall. These observations will inform further eDNA investigations into the reproductive timing and population dynamics of *E. affinis*.

99

Quantifying Environmental Changes on Copepod Metabolism

Esmé Jamison '26 | Patricia Thibodeau, Ph.D.

Copepods are one of the most abundant zooplankton groups globally and are a critical part of the Gulf of Maine ecosystem. This project seeks to analyze the effects of changing environmental conditions (e.g., pH and temperature) on copepod metabolism, measured by oxygen consumption determined optically. Short-term experiments were designed and conducted on copepods collected in Saco

Bay during spring 2025. Results from these experiments aid in determining the mechanisms behind changing copepod population dynamics.

100 Analysis of Phytoplankton *Tripos spp.* Trends in the Gulf of Maine

Emma Hutchings '27 | Patricia Thibodeau, Ph.D.

In the summer of 2023, the Gulf of Maine experienced an expansive algal bloom mainly consisting of *Tripos muelleri*, a dinoflagellate found globally. The aim of this research is to quantify *Tripos spp.*, in Saco Bay and analyze its trends in abundance. Preliminary results indicate that *Tripos spp.* is present throughout the year, and most abundant in summer months. These results help in understanding seasonal dynamics of *Tripos spp.* in predicting future algal blooms.

101 The Impact of Artificial Coastal Structures on the Health of Hills Beach, Biddeford, ME

Sophia King '25 | Will Kochtitzky, Ph.D.

GIS 364 Spatial Analysis

This project aims to visualize and quantify the effects of the Saco River jetty on Hills Beach from the 1950s to the present day by analyzing changes in vegetation coverage and dune elevation. Using aerial imagery and elevation data, this study will assess whether the jetty has impacted beach stabilization and dune restoration over time.

102 The Effectiveness of Coastline Infrastructure on the Beaches of Southern Maine

Aquinnah Thayer '25 | Will Kochtitzky, Ph.D.

GIS 364 Spatial Analysis

Exploring the damage that some beaches across Southern Maine have taken from the storms of January 2024, as well as the new infrastructure that has been developed to prevent future damage and how effective those methods have been in previous weather events.

103 Natural Dunes or Seawalls: Which is Better at Preventing Damage and Erosion on Fortunes Rocks Beach?

Morgan Henderson '25 | Will Kochtitzky, Ph.D.

GIS 364 Spatial Analysis

Coastal storm surges are becoming more frequent and intense due to climate change. These events cause damage to beaches and beachfront infrastructure. Some beaches in Maine have built seawalls to help protect the beaches from damage. Some solutions include building seawalls or replenishing sand that is lost after storms. This project looks at how these storms have affected Fortunes Rocks Beach and how helpful or harmful seawalls have been in protecting the coast.

104 Observing Coastal Erosion on Camp Ellis Beach

Conner Boisvert '26 | Will Kochtitzky, Ph.D.

GIS 364 Spatial Analysis

Camp Ellis has been a major topic for coastal erosion occurring in Maine. It has seen enormous change, as can be seen by the 40 houses that have been lost over the last 100 years. In January 2024, a massive winter storm hit, causing

\$90 million in damages to Camp Ellis' infrastructure. My goal is to observe how this January compared to the last and the impact that the jetty is having on Camp Ellis.

105 Comparing Winter Erosion on Ferry Beach, 2025 vs. 2024

Sophie Cronin '26 | Will Kochtitzky, Ph.D.

GIS 364 Spatial Analysis

Ferry Beach has undergone erosion for decades, losing several feet of dune annually. This project looks at how the 2025 winter impacted the shape of Ferry Beach, specifically by looking at volumetric sand loss. I will compare this winter to our record of photogrammetry data going back to December 2023. The area of greatest interest is the constructed seawall on the beach's northern end and how it could be impacting erosion rates on both sides.

106 Mapping Public Health Accessibility and Inequities Across Maine Using GIS

Jacob Osmer '27 | Will Kochtitzky, Ph.D.

GIS 162 Applications of Geospatial Science and Technology

This project analyzes public health accessibility in Maine by mapping the proximity of households to public health facilities, including hospitals, pharmacies, and grocery stores. Using GIS, geographic disparities and potential health inequity hotspots across counties can be mapped. Data from Maine DOT, Google Maps, and UNE COM highlights rural-urban differences in access.

107 PFAS Levels in Maine and Correlations with Population Size

Emma Lake '26 | *Will Kochtitzky, Ph.D.*

GIS 162 Applications of Geospatial Science and Technology

Per- and polyfluoroalkyl substances (PFAS) are synthetic “forever chemicals” found in non-stick pans, food packaging, makeup, and more. PFAS have made their way into our drinking water, soil, food, and even inside the human body. My research aims to identify correlations between Maine counties’ population size and their level of PFAS contamination. Identifying areas of greatest concern for PFAS contamination can help protect our ecosystems as well as the overall health of Maine residents.

108 Seabird Habitat Change in Coastal Maine

Caven Creskse '26 | *Zach Miller-Hope, M.S.*

GIS 162 Applications of Geospatial Science and Technology

This project looks at how seabird habitats in southern coastal Maine have changed over time. Using GIS maps and satellite images, it explores how things like rising sea levels and human development are causing habitat loss. The goal is to find the areas most at risk and understand what’s driving these changes. This information is important for protecting seabird populations and helping conservation groups plan better ways to keep their habitats safe.

109 Examining the Complexity and Temperature of Narraguagus River Tributaries that Support Young Atlantic Salmon (*Salmo salar*)

Audrey S. Fox '26 | Zach Miller-Hope, M.S.

GIS 162 Applications of Geospatial Science and Technology

The Narraguagus river watershed is one of seven drainage systems that support Atlantic Salmon (*Salmo salar*) reproduction. Being coldwater fish, they are unable to tolerate temperatures above 26.6°C. The solar radiation levels of the tributaries have been compared to the temperatures taken by hand in these tributaries to inform the addition of debris to increase river complexity without reducing the shade in the area, maintaining a constant temperature.

110 Mapping Ideal Wind Turbine Sites in Massachusetts

Jordan Vlcej '25 | Will Kochtitzky, Ph.D.

GIS 162 Applications of Geospatial Science and Technology

With climate change on the rise, the need for renewable energy sources has increased. Wind turbines harness the wind and use it to generate electricity as a clean renewable source. It is considered one of the largest renewable sources in the United States. This project aims to determine optimal areas for wind turbines within the state of Massachusetts using annual average wind speeds and compare to wind conditions in previous years, seasonally.

111 An Analysis of the Coastal Tax Base in Biddeford, Maine

Edward Iannuzzi-Sucich '27 | Zach Miller-Hope, M.S.

GIS 162 Applications of Geospatial Science and Technology

My project goal is to assess how much of Biddeford's tax base resides on the coast. This will be achieved using tax map data as well as coastal and property boundary data. I will buffer the coastal boundary to determine property value within a certain distance from the coast using an attribute table, and use graduated (numerical) symbology to represent values of individual properties. Maps and complementary text will summarize my findings.

112 Wind Turbine Siting: A Sustainable Alternative Energy Source in Pennsylvania

Charles Griffith '27 | Will Kochtitzky, Ph.D.

GIS 162 Applications of Geospatial Science and Technology

This project aims to identify potential sites for wind turbines in Pennsylvania based upon the state's meteorological and economic conditions. The local reduction in fracking and coal energy increases the need for research on sustainable alternatives. Wind data and GIS analysis will be used to identify suitable locations by environmental and infrastructure limitations. Expected results include finding multiple suitable locations, particularly in river valleys and Appalachian regions to support clean energy expansion.

113 Evaluating Seasonal Differences in Phytoplankton Metrics and Photosynthetically Active Radiation Between the PACE and MODIS Satellite Across Various Geographic Regions

Clayton Nyiri '25 | Will Kochtitzky, Ph.D.

GIS 162 Applications of Geospatial Science and Technology

The Planton, Aerosol, Cloud, and Ecosystem (PACE) mission was launched in 2024, by NASA, with the intent of providing top-tier data on global top-of-atmosphere radiance measurements using the Ocean Color Instrument (OCI). Before PACE, the Moderate Resolution Imaging Spectroradiometer (MODIS) deployed in 2002 was the primary mission monitoring Earth. We aim to compare fluorescence line height, daily photosynthetically available radiation, and concentration of chlorophyll gathered from either satellite to look for significant differences between satellites.

BUSINESS POSTERS

B1 Gender Inequality Between the United States, Mexico, and Brazil in Women's Soccer

Kaylynn Laplante '28 | Aimee Vlachos, Ed.D.

SLM 290 Latin American Sport & Gender

This research will discuss many different challenges women soccer players have faced due to gender discrimination and inequality. I focused my research on the United States, Mexico, and Brazil and I will compare and contrast the similarities and differences in discrimination that the players from each countries have endured.

B2 Surfing as a Woman in the United States and Latin America

Lilyann Hagen '26 | Aimee Vlachos, Ed.D.

SLM 290 Latin American Sport & Gender

This research will discuss the hardships women have faced in the surfing world. How women got into the big wave surfing scene and regular surfing competitions. It will discuss the discrimination women have encountered trying to make it big in the surfing world.

B3 Gender Disparity Within Latin American Sports Leadership

Adelaide Hiltabrand '26 | Aimee Vlachos, Ed.D.

SLM 290 Latin American Sport & Gender

Latin American women hold the least amount of power within the sports world when it comes to maintaining a leadership position.

B4 Women's Representation in Coaching in Sports

Patrick Stevens '26 | Aimee Vlachos, Ed.D.

SLM 290 Latin American Sport & Gender

This research will explore women's coaching inside of Latin America and explore to see what type of opportunities are given out to women. It will explore mostly soccer, baseball and softball.

B5 The Importance of Prominent Women In Sports

Stella Bianchi '27 | Aimee Vlachos, Ed.D.

SLM 290 Latin American Sport & Gender

The goal of this research is to explore how prominent women in sports have contributed to the evolution of gender equality, not only within the realm of the sports world but also in society as a whole. In particular, it will focus on how these women have used their platforms to achieve success, challenge stereotypes, advocate for equal rights, and inspire future generations of female athletes.

B6 Representation and its Influence on Young Minds

Ellie Curtis '26 | Aimee Vlachos, Ed.D.

SLM 290 Latin American Sport & Gender

This research will discuss how representation of female athletes in the media is influencing young girls' decisions to join and participate in a sports team. Specifically looking at track and field and swimming, this research is looking at how things like peer pressure, family and societal values, and lack of female role models in these sports is playing a role in young girls deciding to not join a team.

B7 Rowing and the Gender Gap: The Differences and Expectations in Performance

Sarah Bedore '26 | Aimee Vlachos, Ed.D.

SLM 290 Latin American Sport & Gender

The goal of this research is to look at rowing in different cultures and break down the gendered expectations, how it impacts the athletes, and what can be improved moving forward. By gaining an understanding of what an ideal rower is, we can start to break down the gendered gap that is deeply rooted in the sport.

B8 Gender Disparities in Women's Basketball in Latin America

Kimman Power '27 | Aimee Vlachos, Ed.D.

SLM 290 Latin American Sport & Gender

This presentation looks to explore women's basketball in Brazil through the history and development of sport within the country, challenges faced from lack of equal opportunities based on gender, and future landscape for female athletes growing up in Latin America.

B9 Evaluation of Gender Dynamics Within Cheerleading

Sydney Bishop '27 | Aimee Vlachos, Ed.D.

SLM 290 Latin American Sport & Gender

Exploring the dynamics of gender in the feminized sport of Cheerleading, how men and women deal with the gender stereotypes. Specifically evaluating how men navigate through the sport, how it effects their social life (their masculinity and sexuality), and whether women feel like they change according to the sport. This is done exploring the societal view of different countries on gender norms and the sport expectations.

B10 Disparities in Medical Care and Training Support Based on Gender Between Athletes in Europe and the United States

Elizabeth Tracy '26 | Aimee Vlachos, Ed.D.

SLM 290 Latin American Sport & Gender

Disparities in medical leave, training, and family care can play a large role in women's accessibility to and comfort in sports settings. Worldwide, efforts remain towards equity in sports, however it is still common to have less informed trainers on topics of nutrition and exercise for women in the United States and many European countries, even on a professional level. Results and discussion will compare recent developments and struggles specific to professionals in these countries.

B11 Breaking Barriers on Horseback: Gender Norms and Women's Participation in Equestrian Sports in Latin America

Tralee Pomerleau '26 | Aimee Vlachos, Ed.D.

SLM 290 Latin American Sport & Gender

In this presentation, I discuss the differences in equestrian sports in Latin American countries compared to other countries worldwide. My main focus is on Brazil and Mexico and how the main equestrian sport is rodeo and how women find their place in the sport. This differs from other countries where their main sport is show jumping or dressage and the gender differences are much smaller.

B12 The Lack of Women's Sports Media Coverage in Brazil/Latin America/The United States

Jenna Hunt '26 | Aimee Vlachos, Ed.D.

SLM 290 Latin American Sport & Gender

I will be doing research on the lack of sports media coverage on female athletes. I will dive into specific sports, news medias, and data that represents this.

B13 Women Olympic Athletes in Latin America

Francesca Caccamo '26 | Aimee Vlachos, Ed.D.

SLM 290 Latin American Sport & Gender

Examining the history and personal stories of women athletes in Latin America, focusing on their participation in the Olympic Games and the challenges they faced due to gender norms. Also exploring how the Olympics both challenged and reinforced societal expectations, highlighting key moments and influential athletes who broke barriers. I will do this by analyzing personal narratives and cultural shifts, it will reveal the significant impact these women had on promoting gender equality in sports across the region.

B14 Gender Inequality in Women's Football Across Europe and Latin America

Sam Dunham '26 | Aimee Vlachos, Ed.D.

SLM 290 Latin American Sport & Gender

My research examines gender inequalities in women's football across Europe and Latin America. It analyzes how organizational structures, cultural norms, and media coverage affect professional opportunities. This project specifically examines different countries and tournaments and how these aspects along with sociocultural implications affect equality in women's football.

B15 Differences of Mental Health Literacy in Male vs. Female Athletes

Emma Shuman '27 | Aimee Vlachos, Ed.D.

SLM 290 Latin American Sport & Gender

We often hear concerns regarding the link between athletes and mental health. Negative mental health, such as depression, is becoming an increasing concern across the world, especially for adolescents and young adults participating in sports. The purpose of this research is to identify the imbalance of mental health resources provided to male versus female athletes in the areas of Brazil, Australia, and the United States, as well as look into the influences of coaches.

B16 Who's in the Stands? A Demographic Study of Minor League Hockey Fans

Morgan White '25 | Connor Blake, M.B.A.

Center for Sport and Business Innovation Fellowship

The project analyzes the demographic profile of spectators attending minor league professional hockey games. Surveys were conducted in person during one game, gathering data on age, income, gender, ticketing behavior, and interest in the sport from fans. The results offer a snapshot of who attends these events and provide valuable insights for future marketing, outreach, and fan engagement strategies. The findings aim to support more targeted and inclusive approaches to audience development.

Anonymous Donor

ORAL PRESENTATIONS

LEGEND

<hr/>		
The Gulf of Maine: A Looking-Glass into Anthropogenic Climate Change		
<u>Student Author(s)</u>	Lydia Pinard '22 Charles Tilburg, Ph.D.	<u>Faculty Advisor(s)</u>
<u>Abstract</u>	ENV 262 Gulf of Maine Field Studies	<u>Course</u>
<p>The Gulf of Maine (GoM) is warming faster than 99% of the global ocean. We selected 8 buoys throughout the GoM to represent 5 geographic regions. We then calculated specific heat, density, and change in temperature of seawater at each region from 2004-2020.</p>		
<u>Funded by</u>	Decary 208 2:15 p.m.	<u>Presentation Location and Time</u>
Maine Space Grant Consortium, UNE SURE Program		

Characterizing Marine Zooplankton Dynamics in Saco Bay, Gulf of Maine

Erin Anderson M.S. '26 | *Patricia Thibodeau, Ph.D.*

Copepods within the Gulf of Maine provide important support for marine ecosystems through food web dynamics and carbon flux. This project aims to determine seasonal cycles of the meso- and macrozooplankton community in Saco Bay based on weekly samples identified using a Zooscan. Preliminary results from May through November 2024 show zooplankton biovolume was highest in summer. Copepod, *Centropages*, was the most abundant mesozooplankton and hydrozoan, *Obelia spp.*, was the most abundant macrozooplankton.

Decary 203 | 1–1:20 p.m.

Investigating Biomass-Dependent Shedding and the Squishy Crunchy Hypothesis in Green Sea Urchins (*Strongylocentrotus droebachiensis*)

Harrison Stern M.S. '25 | *Markus Frederich, Ph.D.*

Environmental DNA (eDNA) is a biomolecule found in the environment. Recently, a hypothesis called the squishy crunchy hypothesis has established a link between an organism's external morphology and the amount of eDNA shed into the environment. This study aimed to investigate this hypothesis in semi-rigid invertebrates using the sea urchin (*Strongylocentrotus drobochensis*) and examine the feasibility of using eDNA to track *S. drobochensis* in the field.

[National Science Foundation Maine EPSCoR grant \(grant #1849227\)](#)

Decary 203 | 1:25–1:45 p.m.

A Systematic Analysis of Thermal Tolerance Frameworks

Anna Sinclair M.S. '25 | Markus Frederich, Ph.D.

Climate change is an increasing problem for the Maine ecosystem. The Gulf of Maine is one of the fastest warming bodies of water in the world with great biodiversity. To preserve this biodiversity, an understanding of how these animals can be affected by the temperature changes is needed. This study aims to evaluate the various frameworks and methods of studying the thermal tolerance of animals.

National Science Foundation grant# OCE-1948108, CAS Summer Undergraduate Research Experience 2023 & 2024, Maine Space Grant Consortium 2024, Crabs donated by Southern Maine Crabs LLC

Decary 203 | 1:50–2:10 p.m.

eDNA Below the Surface: Assessing Species Presence at Varying Ocean Depths Using Environmental DNA Metabarcoding

Anela McMichael '24, M.S. '25 | Carrie Byron, Ph.D., Markus Frederich, Ph.D.

Environmental DNA (eDNA) refers to genetic material found in environmental samples, offering promising potential for species identification and biomonitoring. Despite its growth, there is limited understanding of how eDNA behaves at varying depths below the ocean surface. This research aims to address this gap by classifying species presence at different depths using metabarcoding analysis. To detect a broad range of species, three primer sets—COI, 18S, and MiFish—are employed.

The Nature Conservancy, The Builder's Initiative

Decary 203 | 2:15–2:35 p.m.

Microplastics as Vectors that Promote Bacterial Colonization of Oysters

Abigail Blouch Vigue '24, M.S. '26, Lauren Adams '25,
Caroline Fales '25 | *Kristin Burkholder, Ph.D.*

Microplastics can be ingested by aquatic organisms including species consumed by humans. Microbes attach to water-borne microplastics, and therefore microplastics may increase risk of pathogens entering the human food supply. Here, we compared *E. coli* colonization and retention in oysters exposed to *E. coli*-coated plastic microfibers versus oysters exposed to *E. coli* alone. We report that microplastics do enhance *E. coli* entry into oysters, but the role of microplastics in bacterial retention is less clear.

This project was supported by a Maine Sea Grant to K.M. Burkholder and C. J. Byron

Decary 203 | 2:40–3 p.m.

The Effects of Temperature on Locomotory Behavior and Energy Metabolism in European Rock Shrimp (*Palaemon elegans*)

Colby Peters M.S. '25, Caleb Poulin '26, Milo Lypps '25,
Ashley Mason '26, Ellie Tracy '26, Jessica Maguire M.S. '26 |
Gwangseok Rex Yoon, Ph.D.

We examined the behavioral and physiological effects of temperature on the intertidal shrimp *Palaemon elegans*. Shrimps were exposed to 20, 25, and 30°C for two weeks. Baseline activity, whole-body metabolic rate as well as enzyme activity were measured to assess energy metabolism. Whole-body protein and triglyceride contents were measured as a proxy for energy allocation. Results will be discussed in the context of how this species will respond to the future climate change.

Decary 203 | 3:05–3:50 p.m.

Investigating Stock Composition and Coastal Migratory Behavior of Saco River Striped Bass (*Morone saxatilis*) Using Network Analysis

Benjamin Gowell '25, M.S. '26 | Will Kochtitzky, Ph.D.,
Michelle Caputo, Ph.D.

Striped bass (*Morone saxatilis*) are an anadromous species and exhibit long distance coastal migrations along the Atlantic coast. Emergency management measures were enacted in 2023 due to population concerns. An increasing challenge in striped bass fisheries management is the complex stock structure and seasonal movement patterns of juveniles and adults. This study explores the movement patterns of striped bass that utilize the Saco River system through acoustic telemetry network analysis.

[Quahog Bay Conservancy, UNE Mini Grant](#)

Decary 205 | 1–1:20 p.m.

Lessons in Adaptation: The Evolution of a Teaching Life Support System

Audrey S. Fox '26 | Michael Galloway, M.S.

The Recirculating Aquaculture System at the University of New England has housed various species over its 15-year operation. Originally a marine mammal tank, its transition to cultivating wild Atlantic Salmon (*Salmo salar*) required significant modifications. Continuous upgrades reflect resourcefulness, adapting to species' needs, technological advancements, and lessons learned. These changes have transformed the system, enhancing its value as a teaching tool and demonstrating the dynamic nature of aquaculture systems.

Decary 205 | 1:25–1:45 p.m.

Investigating Giant Viruses as Vectors of Cell Lysis in the Dinoflagellate *Karenia brevis*

JJ Custer '25 | *Anne Booker, Ph.D., Joaquín Martínez Martínez, Ph.D.*

Florida Red Tide (*Karenia brevis*) is a harmful algal species in Florida and the Gulf of Mexico. A novel group virus has been shown to infect and lyse phytoplankton. We investigated the possibility for giant viruses to infect *K. brevis* through incubation of cells with viral lysates. Flow cytometry visualization determined that viral-like particles replicate in the presence of *K. brevis*, but their identity could not be validated by gel electrophoresis.

[NOAA](#)

Decary 205 | 1:50–2:10 p.m.

Investigation of the Effect of Lunar Cycles on *Ulva* spp. Zoospore Release Timing

Julia Hobbs '27 | *Patricia Thibodeau, Ph.D.*

Ulva spp. offers opportunities for use in seaweed aquaculture due to its high nutrient content. In the lab, zoospore production was highest directly before the new moon. The goal of this project was to determine whether the lunar cycle affects the production of *Ulva* spp. zoospores in the natural environment. A year-long analysis of zoospore collection and measurement indicated no significant correlation between the lunar cycle and zoospore release timing in the field.

[CAS Summer Undergraduate Research Experience 2024](#)

Decary 205 | 2:15–2:35 p.m.

Investigating Seasonal Phytoplankton Changes in Saco Bay Estuary

Terrance Meinardus '25 | Patricia Thibodeau, Ph.D.

MAR 590 Marine Science Research/Thesis

Phytoplankton are the ocean's primary producers, representing the base of the food web. Within the Gulf of Maine, phytoplankton communities are typically composed of diatoms in spring, dinoflagellates in summer, and diatoms in fall. This project aimed to determine weekly phytoplankton community composition in Saco Bay from May 2024 to April 2025. Preliminary results indicate diatoms were most abundant in summer while dinoflagellates were most abundant in fall illustrating local community differences from regional trends.

Maine Space Grant Consortium & Northeast Association of Marine & Great Lakes Laboratories (NEAMGLL)

Decary 205 | 2:40–3 p.m.

Seasonal Striped Bass (*Morone saxatilis*) Monitoring with eDNA and Acoustic Telemetry

Kade Tyrrell '24, Emily Lancaster '24, Benjamin Gowell '25, Josephine Pikowski '25 | Charles Tilburg, Ph.D., John A. Mohan, Ph.D., Markus Frederich, Ph.D.

Environmental DNA (eDNA) was utilized to detect striped bass presence in laboratory trials to test eDNA persistence at high and low densities, with quantifiable detection 2–10 hours after fish removal. Fine-scale eDNA variation was explored through 24-hour sampling and depth comparisons (2m vs. 6m). Results aligned with concurrent data from an acoustic telemetry study, suggesting consistent migration timing and striped bass overwintering in the Saco River across three years.

CAS Summer Undergraduate Research Experience, Maine Space Grant Consortium, St. Francis College Class of '69 Award

Decary 205 | 3:05–3:25 p.m.

Lizzie Baker's Honors Project: The Progression of a Novella

Christine Baker '25 | *Jesse Miller, M.F.A.*

This speaking presentation will follow an individual student's process taken to write a novella, discussing the set-up and research, writing the first draft, as well as the revising and editing used in the second draft. This presentation also highlights unique methods and concepts used in writing in the fantasy genre through the examination of common themes and topics.

Decary 205 | 3:30–3:50 p.m.

Decolonizing American Medicine and Science

Breyauna Jacobs '25 | *Ali Ahmida, Ph.D.*

PSC 491 Integrative Essay

The case of the Tuskegee syphilis experiments and the trachoma surgical experiments.

Decary 208 | 1–1:20 p.m.

Fiction for Feminist Jurisprudence: The Power of the Literary Reality in Feminist Legal Scholarship

Elia M. O'Hara '25 | *Brian Duff, Ph.D.*

PSC 491 Integrative Essay

This paper argues that literature provides a vital theoretical reimagining to feminist jurisprudence. Literary fiction has a unique capability to move beyond the confines of the status quo within society through its structure and themes. Therefore, I urge us to consider that it also has the capacity to surpass the status quo within our legal system to help feminist jurisprudence make lasting progress without drawing from the same problematic power dynamics it hopes to remedy.

Decary 208 | 1:25–1:45 p.m.

How Rhetoric Becomes Legislation: A Case Study on Chaya Raichik, “LibsofTikTok”

Aquinnah Thayer '25 | *Brian Duff, Ph.D.*

PSC 491 Integrative Essay

Chaya Raichik, better known as the username @LibsofTikTok on X, has become a leading voice in a wider political movement to restrict and remove the rights of LGBTQ+ Americans through legislation. This presentation explores how her chosen medium strengthens her rhetoric, as well as any trends in the legislation that has been introduced throughout statewide legislatures and now the Congress of the United States of America.

Decary 208 | 1:50–2:10 p.m.

Creating Solutions to Trust in a Failing Democracy

Madeline Apgar '25 | *Brian Duff, Ph.D.*

PSC 491 Integrative Essay

Democracy is being threatened and invalidated due to the growing distrust of American citizens in their government. The justified reasons for lacking trust varies among different social groups and citizens with differences in political priorities. In order to solve this issue, I analyze the views of four political theorists that propose differing ideas of what democratic reformations could effectively rebuild and strengthen trust. In my assessment of these ideas, I draw conclusions about what has the most potential to rebuild trust as I compare the theories to the facts about the nature of trust.

Decary 208 | 2:15–2:35 p.m.

Supreme Court Reform Rediscovered

Adria Horton '25 | *Brian Duff, Ph.D.*

PSC 491 Integrative Essay

Supreme court reform has been proposed and debated for almost a century, with suggestions like court packing, ethics reform, and term limits attracting the attention of policy makers and citizens alike. Recent years have shown all-time lows for supreme court approval, leading to public outcry for reform, but with no success. To understand reform legitimacy and real progress, my research identifies the motivational factors individual people are most galvanized by present day.

Decary 208 | 2:40–3 p.m.

The Significance of the Department of Education: How the Lack of Legislation Will Ruin America

Alexis Smith '25 | *Brian Duff, Ph.D.*

PSC 491 Integrative Essay

This research talk will address the educational impact of the legislation passed by President Bush (No Child Left Behind) as well as President Obama (Every Child Succeeds act), specifically addressing how the dismantling of the DOE will harm students, and reverse the observed benefits from both of these legislations.

Decary 208 | 3:05–3:50p.m.

Imaginative Relationship With the Law

Keely Kasputis '25 | *Brian Duff, Ph.D.*

PSC 491 Integrative Essay

Our feelings about crime and the law vary depending on the source, which means how we perceive trials, justice, and legal systems is shaped by the type of media through which we receive information. Traditional and social media impact our perceptions

of trials differently. It relates to our imaginative relationship with crime in the law, reflecting how individuals and societies conceptualize and engage with these issues.

Decary 208 | 3:30–3:50 p.m.

Resisting Change: Extra-Legal Backlash to Women's Legal Empowerment

Sarah Dill '25 | Brian Duff, Ph.D.

PSC 491 Integrative Essay

This thesis explores the interaction between legal advancements for women's rights and the corresponding extra-legal responses from men. It highlights key milestones, such as Title IX and the recognition of sexual harassment as sex discrimination, to illustrate shifts in workplace authority. The proposal critically examines how men perceive and react to increasing female authority, proposing a deeper understanding of these dynamics to foster more equitable legal and societal frameworks.

Decary 208 | 3:55–4:15 p.m.

Effect of Anthropogenic Noise on House Cricket (*Acheta domesticus*) Anti-Predator Behavior

Megan Boudreau '25, Shauni Ross '25, Andrew Lemieux '26 | Margaret Stanton, Ph.D.

PSY 425 Advanced Methods in Animal Behavior

Previous research indicates that anthropogenic noise can alter interactions between and within species. Perceived predation risks lead to anti-predator behavior, such as longer hiding periods. We hypothesize that the cricket anti-predator responses will depend on the presence of predator cue and anthropogenic noise. We predict that the anthropogenic noise and predator noise condition will exhibit the longest duration of hiding behavior.

Decary 212 | 1–1:20 p.m.

Antipredator Behavior in House Crickets (*Acheta domesticus*) in Relation to Active and Ambush Predators

Elliot LaGanza '25, Ella Miller '25, Kira Connors '25 |
Margaret Stanton, Ph.D.

PSY 425 Advanced Methods in Animal Behavior

Previous research indicates house crickets adjust their behavior in response to chemical cues in the environment. We believe that in response to exposure of a chemical cue from a predator who actively hunts (such as a common spider) a house cricket will freeze, but when the chemical clue comes from an ambush predator (such as a rat) the cricket will flee.

Decary 212 | 1:15–2:35 p.m.

Food Over Fear?: Assessment of Risk and Latency to Approach Food in the House Cricket (*A. domesticus*)

Brooke Coen '25, Maya Galpern '25, Santina Cardoni '25 |
Margaret Stanton, Ph.D.

PSY 425 Advanced Methods in Animal Behavior

House crickets (*A. domestics*) use chemical cues to inform foraging behavior and predator reactions. We conducted a study to investigate the latency period of adult male house crickets to approach a food source in the presence of a chemical predator cue as opposed to the absence of or a non-predator cue. We also examined their likelihood to emerge from a refuge when a chemical predator cue is nearby rather than far from the refuge.

Decary 212 | 1:25–1:45 p.m.

Ability of Female House Crickets (*Acheta domesticus*) to Find Mates with the Presence of Anthropogenic Noise

Kaleigh Laurendeau '25, Sarah Pointer '25 |
Margaret Stanton, Ph.D.

PSY 425 Advanced Methods in Animal Behavior

Previous research indicates that house crickets (*Acheta domesticus*) take longer to find a mate in the presence of anthropogenic noise and that female crickets prefer mate calls with higher intensities. We hypothesize that the ability of female crickets to find mates will depend on the presence of anthropogenic noise and the intensity of mating calls.

Decary 212 | 1:50–2:10 p.m.

The Impact of Rhythmic and Anthropogenic Noise on Male Cricket Calling Behavior

Emma Brown '25, Rylie Hastings '25 | *Zach Olson, Ph.D.*

PSY 425 Advanced Methods in Animal Behavior

We will be presenting the results of an experiment testing how rhythmic and anthropogenic noise affect male cricket calling behavior. Crickets will be exposed to either rhythmic or anthropogenic noise, and their call frequency, timing and adaptations will be analyzed using RavenLite Software. We hypothesize that crickets who are exposed to rhythmic noise will adjust their calls by utilizing the gaps in the noise, resulting in higher call rates compared to those exposed to anthropogenic noise.

Decary 212 | 2:40–3 p.m.

Determining Female House Cricket Mate Call Preference: Chirp Rate vs. Frequency

Peyton Stevens '26, Haley Hines '25, Maria Hernandez '25 | Zach Olson, Ph.D.

PSY 425 Advanced Methods in Animal Behavior

Using a two-choice design and an Y-shaped experimental chamber, we test if female House Crickets prefer certain qualities of mate calls by presenting them with a high frequency and fast chirp rate call.

Decary 212 | 3:05–3:25 p.m.

Impact of Scent Familiarity on Exploratory Behavior Performance in *Acheta domesticus*

Miranda Boswell '25, Kelly Deegan '25 | Zach Olson, Ph.D.

PSY 425 Advanced Methods in Animal Behavior

In this presentation, researchers Miranda Boswell and Kelly Deegan will report the findings of their original research regarding the impact of familiarity of olfactory cues on willingness to perform exploratory behavior in a novel environment on focal species *Acheta domesticus*. This research was performed as part of PSY 425: Advanced Methods in Animal Behavior.

Decary 212 | 3:30–3:50 p.m.

DIRECTORY

POSTERS BY AUTHOR

Name	Poster #		
Ahmida, Zachary	41	Caccamo, Francesca	B13
Aikens, Mariah	24	Canarelli, Alyssa	D1
Allen, Cora	43, 44	Capeless, Valerie	61
Barron, Alexandria	D1	Carrier, Lauren	12
Bartlett, Colby N.	D1	Carrozzo, Caycie	79
Bartolome, Jaylyn	4, D1	Carter, Marissa	68, 69
Beauvais, Mackenzie	59	Case, Ethan	59
Bedore, Sarah	B7	Caterina, Michael	41
Bender, Jillian	10	Catling, Emma	66
Beyrouty, Alexa	28, 29	Chaisson, Katherine	23
Biagi, AnnaMaria	44	Christopher, Emma	96
Bianchi, Stella	B5	Clendenny, Steven	38
Birchem, Johanna	76, 85, 86, 87	Contreras, Kasey	15
Bishop, Sydney	B9	Corvelo, Bryan	84, 85
Bjerkness, Hanna	75, 76	Crekse, Caven	108
Bleyle, Maxwell	32	Cronin, Sophie	105
Boisvert, Conner	104, D1	Crow, Liberty	91
Borzi, Natalie	66	Crowley, Marisa	39
Bouchard, Ashlyn	60	Curran, Shauna	24
Bradley, Alanna	16	Curtis, Ellie	B6
Burke, Ethan	65, 66, 76	Custer, JJ	29

Da Costa, Carson	15	Flanagan, Trevor	41, 42
Delgado, Mariyalee	48	Fontaine, Aidan	64
Deren, Rachel	14	Ford, Jacob	52
Desai, Jatan	80	Fortier, Eva	57
Devlin, Alexandra	1, 19	Fox, Audrey S.	109
DeVries, Paige	79	Gallagher, Daniel	53
DeWater, Katelyn	76, 85	Galpern, Maya	9, 10, 11
DiBona, Aidan	2	Gantert, Josh	37
Diefenbach, Morgan	61	Gardner, Rachel	32
Doeppers, Annika	92	Garrant, Ryan	66, 67
Doser, Ryleigh	3	Gilbert, Kayleigh	63
Downs, Eliza	8	Gillilan, Gavin	48
Dunham, Sam	B14	Girard, Lucas	36, 37
Duthaler, Alexander	65	Gogan, Caitlyn	6, 7
Dyer, Regina	70	Gorham, Robin	50
Ellis, Olivia	66	Gorrondona, Mason	75, 76
Ellis, Ruth	83, 85	Gosse, Bailey	54
Ellwanger, Tyler	67	Gottlieb, Christopher	D1
Engelhard, Royce	12	Gowell, Ben	D1
Evans, Anna	66	Gray, Sarah	21
Fales, Caroline	58	Green, Ella	65
Farnum, Gracie	64	Griffith, Charles	112
Faulkner, Evan	2	Guignard, Alexandra	35
Fecteau Volk, Claire	74	Ha, Huy	38
Fitz, McKenzie	11	Hagen, Lilyann	B2

Hale, Christine	41	Jenkins, Luke	41
Hanratty, Kelly	1	Jerome, Kensington	6
Harriman, William	41	Johnson, Kelsey	12
Harvey, Zachary	D1	Joshi, Celana	2
Hastings, Rylie	D1	Kamoen, Evan	12
Hatfield, Amy	D1	Kasputis, Keely	62
Haverty, Casey	63	King, Sophia	101
Henderson, Morgan	103	Kunesh, Mckenzie	22
Hennessy, Peter	61	Kuzmich, Ryan	D1
Higgins, Natalie	21	Lake, Emma	107
Hiltabrand, Adelaide	B3	Lamarche, Kyle	29
Himelfarb, Daniel	18	Lanza, Sophia	D2
Hooker, Jack	90	LaPlante, Kaylynn	B1
Houston, Madelyn	51	LaRose, Koby	79
Huff, Trinity	21	Lattanzi, Camilla	41, 42
Hunt, Jenna	B12	Leighton, Olivia	95
Hutchings, Emma	100	Leite, Kristen	6
Hutjens, Grace	9	Lewark, Lily	4
Iannuzzi-Sucich, Edward	111	Libby, Stella	2
Illsley, Anna	24	Lienkamp, Keelin	47
Isabelle, Claire	7, 8	Livengood, Ella	20
Jamison, Esmé	99	LoRe, Jhana	11
Janik, Tyler	76, 77, 85	Lovely, Jayden	49
Jareo, Em	32	Lux, Adam	D1
Jenisch, Sydney	47	Lynch, Bridget	1

DIRECTORY			
Lypps, Milo	27, 29	Nowak, Connor	41
Marino, Lily	3	Nowell, Hannah	15
Martin, Jessica	35	Nyiri, Clayton	76, 113
Martin, Sophie	56	Ochs, Arianna	35
Martine, Jackson	75, 76	O'Hagen, Dylan	66
Marvin, Heather	9	Ohman, Sawher	67
Mason, Ashley	29, 30, 31	O'Leary-Curcio, Olivia	3
Mayo, Caitlyn	46, 47	Onyemelukwe, Ginika	60
Mazurkiewicz, Erin	64	Osmer, Jacob	106
McCarthy, Danielle	1, 19	O'Toole, Andrew	33, 34
McGoldrick, Tyler	40	Parks, Isabella	10
McGovern, Nicholas	93	Parlapiano, Cloey	66
McKibben, Jack	D1	Penrose, Kendra	39
McMaster, Mary	62	Peters, Colby	26, 27, 30
Meek, Magdalene	56, 57	Petersen, Natalia	4
Mendez, Rachel	8, 9	Pikowski, Josephine	81, 82
Merrill, Paige-Marie	85	Pittsley, Matthew	85
Messina, Mackenzie	25	Pomerleau, Tralee	B11
Mickiewicz, Kara	72	Poulin, Caleb	26
Miguel, Caitlin	47	Power, Kimman	B8
Motulsky, Ruby	73, 74	Prakash, Babia	48
Murthi, Ella	22	Prokop, Sarah	D1
Nate, Hadli	2	Quatrano, Samantha	60
Nelson, Ryan	D1	Ramos, Zakary	D1
Noon, Lily Ann	62	Rank, Tika	D1

Render, Logan (Madison)	3	Tasca, Abby	12
Richards, Emilee	6	Thayer, Aquinnah	102
Rollo, Robyn	67	Theriault, Alya	79
Ross, Hailey	11	Tracey, Kerry	39
Sclafani, Finn	41, 42	Tracy, Elizabeth	76, 78, B10
Seger, Emma Rose	35	Trost, Grace	44, 45
Shuman, Emma	B15	Turcotte, Dawson	41
Silva, Evelynnn	18	Visbeek, Tim	25
Spiese, Sam	37	Vlcej, Jordan	110
Spooner, Megan	16	Weaver, Quinn	23
Stagg, Piper E.	98	Westerberg, Lillian	97
Staniar, Kimberly	63, D1	White, Morgan	B16
Stanizzi, Joe	D1	Wonson, Ashton	38
Steen, Maddy	66, 67		
Stefándóttir, Þóra	17		
Stevens, Jadyn	22		
Stevens, Patrick	B4		
Stiles, Emma	17		
Stiver, Isabelle	75, 76, D1		
Stoehr, Gabriel	40		
Straube, Mikayla	12, 13		
Swenson, Erik	94		
Swift, Williard	40		
Taranto, Tristan	75, 76, 88, 89		

ORAL PRESENTATION SCHEDULE

	Decary 203	Decary 205	Decary 208	Decary 212
1:00 – 1:20 p.m.	Anderson	Gowell	Jacobs	Boudreau
1:25 – 1:45 p.m.	Stern	Fox	O'Hara	Coen, Galpern, and Cardoni
1:50 – 2:10 p.m.	Sinclair	Custer	Thayer	Laurendeau and Pointer
2:15 – 2:35 p.m.	McMichael	Tyrrell	Apgar	LaGanza, Miller, and Connors
2:40 – 3:00 p.m.	Blouch Vigue	Meinardus	Horton	Brown & Hastings
3:05 – 3:25 p.m.	Peters	Hobbs	Smith	Stevens, Hines, and Hernandez
3:30 – 3:50 p.m.		Baker	Kasputis	Boswell and Deegan
3:55 – 4:15 p.m.			Dill	

* *Italics indicate a graduate student.*

THANK YOU

THANK YOU!

The 25th Annual College of Arts and Sciences Spring Research Symposium would not be possible without the support of many individuals and organizations who each contribute in their own way. Our record number of presentations this year is a testament to the enthusiasm and aptitude that our students have for research, scholarship, and creative activity, and the dedication of many members of the UNE Community and beyond toward supporting such endeavors.

First a hearty THANK YOU to the faculty and professional staff mentors who have supported the students in carrying out their scholarly work or class projects presented here today. Your generosity of time and effort has allowed the students to complete truly remarkable work.

Thank you to UNE's Conference Services, Institutional Advancement, Facilities Management, and the Office of Communications for their help executing this event.

Several agencies have sponsored the students' research through fellowships and grants, including: Maine Sea Grant, the National Institute of General Medical Sciences (NIGMS) Centers of Biomedical Research Excellence (COBRE), the National Council of Teachers of Mathematics, the National Institute of Neurological Disorders and Stroke, the Kahn Family Foundation, BioME, the National Science Foundation and the Maine EPSCoR Grant, UNE Office of Research and Scholarship, Maine Outdoor Heritage Fund, Maine Space Grant Consortium, Southern Maine Crabs LLC, The Nature Conservancy, the Builder's Initiative, Quahog Bay Conservancy, the National Oceanic and Atmospheric

Administration (NOAA), St. Francis College Class of 1969, and the Northeast Association of Marine & Great Lakes Laboratories (NEAMGLL).

Finally, a warm thank you to Rachel Voldstad for coordinating poster printing and to Erinn Stetson, who oversees planning and execution of the event, for her dedication to making this symposium a success year after year.

— Amy Keirstead, Ph.D.



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