University of New England
College of Arts and Sciences

26TH ANNUAL SPRING RESEARCH SYMPOSIUM

Friday • May 1, 2026

UNIVERSITY OF NEW ENGLAND

INNOVATION FOR A HEALTHIER PLANET

CONTENTS

RESEARCH AT UNE

On behalf of the UNE College of Arts and Sciences (CAS) Dean's Office, welcome to the 2025-26 CAS Spring Research Symposium! This event, now in its 26th 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 1, 2026 | 9:30 a.m.–4 p.m.

9:30–11:30 a.m.

Poster Presentations and Displays
Alfond Forum 283 A/B

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

Gwendolyn Mahon, M.Sc., Ph.D.
Provost and Senior Vice President for Academic Affairs

Christina Perazio, B.S. ’11, Ph.D.
B.S. Psychobiology
Distinguished Alumni Speaker

Amy Keirstead, Ph.D.
Associate Dean, College of Arts and Sciences

1–4 p.m.

Research Talks
Decary Hall, Rooms 203, 205, 207, 208, and 212

DISTINGUISHED ALUMNI SPEAKER

Christina Perazio, Ph.D., B.S. ’11

Christina Perazio, Ph.D., B.S. ’11 (Psychobiology, minor in Marine Biology) is an assistant professor in the School of Natural Sciences at Canisius University and a research associate and affiliated faculty in the Department of Environment and Sustainability at the University at Buffalo. Following her undergraduate degree at UNE, Perazio earned her M.A. in Experimental Psychology from the University of Southern Mississippi and her Ph.D. in Evolution, Ecology, and Behavior from the University at Buffalo.

As the principal investigator of the Perazio WildWaves Lab, her work investigates the acoustic structure of communication signals of humpback whales in Colombia and how anthropogenic noise — such as that from boats — interacts with the structure and frequency of humpback whale songs. A new direction for her research program closer to home includes studying the social-vocal repertoire of bats, which is impacted by terrestrial sources of noise. A true teacher-scholar, Perazio teaches both introductory animal behavior courses and upper-level coursework in the Animal Behavior, Ecology, and Conservation major at Canisius and involves both undergraduate and graduate students in all aspects of her research program.

Perazio has authored eleven peer-reviewed publications, given nearly 30 presentations and invited talks, and has secured over $40,000 to support her scholarly endeavors. She has been nominated for or received numerous awards, including the Department of Psychology Excellence in Teaching Award from the University at Buffalo and the Frank A. Beach Comparative Psychology Award for the Best Paper of the Year in the *Journal of Comparative Psychology*, and seeks out opportunities to engage with diversity, equity, and inclusion trainings and initiatives.

While a student at UNE, Perazio engaged in undergraduate research with Teresa Dzieweczynski, Ph.D., professor emeritus, in Animal Behavior. Their work focused on understanding how communication networks in Siamese fighting fish were influenced by previous interactions with other fish. Perazio's research with Dzieweczynski culminated in two peer-reviewed publications and three professional presentations. Perazio was inducted into Psi Chi, Alpha Chi, and was recognized for her scholarly prowess as the 2011 recipient of the Charles H. Turner Award from the Animal Behavior Society. We are delighted to welcome Christina Perazio back to UNE and CAS as the 2026 Distinguished Alumni Speaker.

POSTER PRESENTATIONS AND DISPLAYS

LEGEND

63. Goat Island Alternative Energy Project

Student Author(s) Cameron Indeck ’22 | *Pam Morgan, Ph.D.* ***Faculty Advisor(s)***

Course *ENV 262 Gulf of Maine Field Studies II*

Abstract

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.

Funded by

Kennebunkport Conservation Trust and the Gulf of Maine Institute.

DISPLAYS

FEATURED DISPLAY

Remembering A World Beyond Human Understanding: Holocaust Monuments and Memory

Connor Boisvert ’26, Chloe Boulle ’27, Lily Furtado ’26, Quinn Hinsley ’27, Maeve MacAulay ’28, Leah Palinkas ’26, Riley Swan ’28, Lillian Westerberg ’27, Marly Wisecarver ’28 | *Eric G. E. Zuelow, Ph.D.*

In the years following World War II, memory of Nazi mass murder ebbed, flowed, and evolved. This exhibit explores the physical presentation of memory through the use of monuments. Visitors will encounter different ways of commemorating the unthinkable and will be asked to consider the very meanings of memory, the ways in which we both recall and forget.

D1 Silent Ocean — Blue Whale Art Presentation

Chloe Boulle ’27 | *Stephen Burt, M.F.A.*

A small collection of ink and brush drawings depicting the blue whale and its plight in warming oceans. As ecosystems are disrupted blue whales struggle to eat, causing a decline in their song, the silent spring of our seas. In this body of work I use the black and white of ink on paper to show the gravity of the blue whales' story.

D2 Modern Jungle

Jasmin Townsend-Ng ’26 | *Stephen Burt, M.F.A.*

This art series is meant to bring more attention to how animals are explicitly and implicitly exploited by people. This piece was made with duck canvas and acrylic paint. A design was drawn on using a projector and painted with acrylic paint mixed with standard varnish. The piece was both machine and hand sewn on the outline to add dimension to the piece. Pillow stuffing was used to further emphasize the different parts of the piece.

D3 Romantic Landscapes

Sophia Lanza ’26 | *Sarah Gorham, M.A.T., M.F.A., Charles Thompson, M.F.A.*

Typically I paint conceptually, with an idea in my head that I plan to render on canvas. This year throughout the course Landscape Painting I explored painting from observation. As opposed to painting to express a message or idea, I painted to express a mood and a tone. Turns out I use a romantic lens when looking at the world around me, as revealed by my paintings.

POSTERS

1 Tattooed or Judged? The Influence of Tattoo Style and Gender on Social Perceptions

Jadyn Stevens ’27, Drew Bouchard ’27, Ethan Herndon ’27, Mariyalee Delgado ’27, Xander Hampe ’27 | *Jennifer Stiegler-Balfour, Ph.D.*

PSY 285 Research Methods

In recent years, tattoos have become increasingly popular. As a permanent and highly visible form of self-expression, tattoos can play an important role in impression formation. Despite their growing prevalence, people with tattoos may still encounter negative stereotypes or controversy (Molloy & Wagstaff, 2021). The present study examines how tattoo style and gender of the tattooed individual influences observers’ first impressions, particularly perceptions of attractiveness, confidence, kindness, approachability, and trustworthiness.

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

Jadyn Stevens ’27, Sabrina Packer ’28, Lily Lewark ’27 | *Jennifer Stiegler-Balfour, Ph.D.*

This study examines comprehension differences across three modalities: reading, listening, and reading-while-listening (RWL) for narrative and expository texts in college students. A moderation analysis highlights modality as a significant predictor of reading comprehension, suggesting better comprehension in the reading condition compared to either the listening or RWL conditions. The study investigates interactions with reading skill, working memory, and neurodiversity, with the purpose to guide educational uses of audiobooks and accessibility for diverse learners.

3 Clutter, Comfort, and Gender Preferences

Heather Martin ’28, Nicholas Moore ’26, Mckenna Patterson ’28 | *Josh Mangin, Ph.D.*

PSY 285 Research Methods

Study of the preferences between gender on their preferred physical environment.

4 The Dangers of Doomscrolling

Maddie CotNoir ’28, Kadie MacMillan ’28, Nora Moldover ’27, Janessa Valle ’27 | *Josh Mangin, Ph.D.*

PSY 285 Research Methods

Doomscrolling is a type of persistent obsessive media consumption. This behavior can have an impact on the user’s social life. Our study asks how does online doomscrolling affect college students’ social lives. Using a survey we will be asking our participants questions about their social media use followed by questions on their social life. We will then take these two data points and compare them to find if doomscrolling has an impact.

5 How Daily Exercise and Sleep Influence Our Dream Recall

Olivia Dowd ’27, Ella Graffius ’27, Jillian Kirby ’27, Hannah Nowell ’27 | *Josh Mangin, Ph.D.*

PSY 285 Research Methods

This study explores whether daily exercise and sleep patterns affect dream recall among college students. We surveyed students anonymously about their exercise and sleep habits, as well as how often and clearly they remember dreams. We hypothesize that those who exercise more and sleep longer recall their dreams better. Our goal is to understand how lifestyle choices like activity and sleep influence what we

remember from our dreams, offering insight into cognitive processes during sleep.

6 Archaeological Representations of Birds in the Far Northeast

Peyton Stevens ’26 | *Arthur Anderson, Ph.D.*

ARC 397 Archeology and Animals

Bird effigies have been analyzed throughout the northeast and eastern parts of Canada, but they have rarely been connected to the species distribution in a landscape. Therefore, mapping bird effigy discoveries at archaeological sites and their interpreted species will allow for comparisons to modern distributions with the goal of better understanding environmental conditions pre-contact. This presentation contextualizes these effigies and attempts to conduct species identification by using available artifacts in published works and museum collections.

7 Optimization of Enzymatic Assays for Glycolytic Enzymes in the European Rock Shrimp *(Palaemon elegans)*

Katheryn Fuller ’28, Elijah Reulet ’27,
Ellie Tracy B.S. ’25, M.S. ’26 | *Gwangseok Rex Yoon, Ph.D.*

A study investigating the effects of semaglutide and thermal stress on *Palaemon elegans* (European rock shrimp) will use hexokinase and pyruvate kinase activity assays to assess changes in glycolytic capacity. To do so, enzyme activity assay protocols must be optimized for *P. elegans*. Preliminary assays were conducted to confirm reagent reactivity and determine effective homogenate concentrations. Results will be discussed in the context of calculating maximum enzyme activities and their subsequent physiological implications.

Maine Space Grant Consortium

8 Developing Preliminary Measurements for Metabolic Rate in the American Eel *(Anguilla rostrata)*

Faith Santiago ’28, Lily DeSpirito ’27, Madison Nance ’27, Catriel Conroy ’26, Christina Eiler ’27, Elijah Reulet ’27, Alyssa Fritschka ’28 | *Gwangseok Rex Yoon, Ph.D.*

We developed methods to measure baseline metabolic rate of the American eel *(Anguilla rostrata)*. An intermittent flow respirometer and custom acrylic respirometry tubes were used to collect data, which will be used to compare metabolic rate across temperatures from 15-25 degrees Celsius. This data will be used to expand the limited knowledge of how temperature changes impact metabolic rate of Anguilliformes, which is important to understand for conservation efforts of Anguilliformes due to climate change.

9 Don’t Hold Your Breath! Measuring Standard Metabolic Rate of Eastern Oysters *(Crassostrea virginica)* Under Cold Temperature Conditions

Catriel Conroy ’26, Lily DeSpirito ’27, Christina Eiler ’27 | *Gwangseok Rex Yoon, Ph.D.*

Research on Eastern oysters *(Crassostrea virginica)* largely examines metabolic responses to warm conditions. Contrastingly, this study aims to measure standard metabolic rates under cold temperatures using flow-through respirometry to better understand their full aerobic scope. Recovery from handling stress, focused on their ‘clamming up’ response, was also assessed due to its impact on metabolic measurements. As key ecosystem engineers, understanding how oysters’ physiology and stress responses change as a reaction to their environment is critical.

10 SPLASH: Salinity Plume Locating Using Aerial Sensing of Hydrodynamics in the Saco River Estuary

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

Estuaries mix freshwater and saltwater, creating salinity patterns vital to ecosystem health. This study tested drone-assisted surface sampling using a SwellPro SplashDrone and HOBO sensor at six sites, spanning multiple tidal stages, over fall, winter, and spring conditions and capturing measurements before and after weather events. Our results demonstrate the feasibility of drone-based observations even in harsh conditions and establish a foundation for low-cost platforms capable of monitoring water-quality across diverse environmental and weather conditions.

11 Spatial Relationships Between Surface Currents and Argo Float Temperature and Biogeochemical Profiles

Josephine Pikowski ’26 | *Will Kochtitzky, Ph.D.*

GIS 210 Applications of GIS

How do satellite-derived surface currents relate to temperature and biogeochemical (BGC) conditions measured by Argo floats along the Gulf Stream? This project will examine spatial patterns in Ocean Surface Current Analyses Real-time (OSCAR) surface currents and compare them with Argo Float temperature and BGC variables to understand how physical circulation influences water-column structure. This analysis will help determine how effectively satellite-derived surface currents capture physical processes that shape ocean conditions across time.

12 Quantifying Temporal Shifts in Coastal Phytoplankton Community Composition in the Gulf of Maine

Emma Hutchings ’27, Abi Brinkmann ’28 | *Patricia Thibodeau, Ph.D.*

MAR 410 Marine Science Research

Phytoplankton are microscopic photosynthesizing organisms that are essential members of marine ecosystems through their role as primary producers and ability to serve as bioindicators of oceanic change. This project analyzed population-based changes in phytoplankton community composition in Saco Bay over two years to determine whether significant shifts occurred in the region. Results increase understanding of how these shifts may continue and potential implications for the future Gulf of Maine ecosystem.

IDeA Network of Biomedical Research — Summer Undergraduate Research Fellowship

13 Utilizing GIS Technology to Identify Optimal Bivalve Aquaculture Site Locations on the Coast of Maine

Emma Hutchings ’27 | *Will Kochtitzky, Ph.D.*

GIS 210 Applications of GIS

Bivalve aquaculture is a rapidly growing and evolving industry in Maine, as it is both sustainable and profitable for Maine’s coastal industry. This project aims to use GIS technology to identify optimal farming locations based on environmental and legal parameters, which will not only add an economic benefit by allowing farmers to grow more, higher quality shellfish, but can also help to prevent unnecessary environmental burdens.

14 Building a Convoluted Neural Network (CNN) for Game Camera Analysis Using Claude AI

Peyton Stevens '26 | *Will Kochtitzky, Ph.D., Noah Perlut, Ph.D.*

GIS 399 AI for Geospatial Problems

This project utilizes the large language model Claude AI to help write script that creates and trains a Convoluted Neural Network (CNN) to follow a two-stage process: identify if an image has an animal within a game camera image, and correctly identify what species of animal it is with high levels of accuracy, precision, and recall. Outputs indicate animal location within images, and species identified for swift human review to further cut processing time.

15 Sea Level Rise and Erosion at the Squire's Point Archaeological Site

Peyton Stevens '26 | *Will Kochtitzky, Ph.D., Arthur Anderson, Ph.D.*

GIS 210 Applications of GIS

Using single frame aerial photos and NAIP imagery this project quantifies the erosion of the Squire Point archaeological quarry site on Roque Island from the 1940s through to present. Future projections of Sea Level Rise (SLR) are analyzed to determine how much area of the island will be predicted to be submerged in 5, 20, and 50 years. Lidar data is utilized to analyze coastline erosion patterns to determine areas of accelerated land loss.

16 Impacts of Animal Preference Upon the Gender Stereotyping of Dogs and Cats

August Monnelly ’28, Haley Puchalski ’28, Emma Rioux ’28, Anna Stratton ’28 | *Josh Mangin, Ph.D.*

PSY 285 Research Methods

Personal preferences and appearances can significantly impact how people gender dogs and cats. We examined the likelihood of participants to adhere to traditionally gendered naming conventions when presented with images of dogs and cats. We hypothesized that stereotyping was more likely to occur in opposition to an individual’s preference. To test this hypothesis a survey was created asking participants to label cats and dogs with a male, female or gender neutral name.

17 Swipe Right? How Attractiveness and Personality Shape Romantic Interest

Ned Mickey ’27, Gianna Beer ’28, Kha Cao Ra James ’27, Sam Little ’27 | *Jennifer Stiegler-Balfour, Ph.D.*

PSY 285 Research Methods

Physical attractiveness has been linked to how people form first impressions, especially in online dating environments. Past research suggests that attractive individuals are often perceived as more socially desirable and approachable, regardless of their personality traits. The current study examines how attractiveness and personality stability influence perceptions of approachability and interest in either short- or long-term romantic relationships. Participants viewed a single dating profile with a brief description and rated the person on a 5-point Likert scale measuring approachability and likability. We hypothesize that profiles rated higher in attractiveness will also be rated as more approachable, likable, and desirable romantic partners, regardless of other personality information, though negative personality traits may weaken this effect.

18 Socials, Steals, and Deals: How Social Media and Timed Promotions Influence Buying Behaviors

Ellie Stanfield ’28, Kira Collins ’28, Gavin Gillilan ’27, Kaylen Taddia ’26 | *Jennifer Stiegler-Balfour, Ph.D.*

PSY 285 Research Methods

Social media use and online shopping have increased significantly in recent years, creating new opportunities for product promotion. The current study examines the relationship between social media product exposure and time-sensitive discounts, and how these factors influence consumers’ likelihood of purchasing a product. Participants were presented scenarios with varied levels of social media promotion and available time to receive the discount. The study explores how these factors affect purchase intentions in an online shopping context.

19 The Self and College Student Drinking Behavior

Logan Render ’27, Kelly Hanratty ’27, Alex Devlin ’26, and Danielle McCarthy ’26 | *Julie Longua Peterson, Ph.D.*

PSY 486 Advanced Research in Psychology

This study examines the relationship between self-esteem, need to belong (NTB), and gender in how they influence drinking behavior among college students. Drawing on research linking self-esteem and social motives to alcohol use, the study investigates whether individuals with lower or higher self-esteem report greater alcohol consumption, and whether gender moderates this effect. Regression analyses will test these interactions to predict drinking frequency, quantity, and frequency of drinking conversations.

20 A Decade of Decline and Signs of Rebound: Changes in College Student Self-Esteem and Self-Concept Clarity Over 15 Years

Alexandra Devlin ’26, Danielle McCarthy ’26 | *Julie Longua Peterson, Ph.D.*

This study compares data on self-esteem and self-concept clarity across the last decade (2010-2025; N=4283). Results indicate that both self-esteem and self-concept clarity decreased significantly from 2010-2019, reaching their lowest point during COVID-19 (2020-2022). However, data from 2023-2025 suggest self-esteem and self-concept clarity are rebounding.

21 Forty Years of Succession: Deep Learning Classification of Post-Eruption Vegetation and Topographic Change at Mt. St. Helens

Regina Dyer ’26 | *Will Kochtitzky, Ph.D.*

GIS 399 AI for Geospatial Problems

This poster examines vegetation and elevation change at Mount St. Helens from 1980 to 2020 using multitemporal Landsat imagery and Digital Elevation Models (DEMs). A Convolutional Neural Network (CNN) will be trained to classify topographic and vegetation changes over forty years. Understanding how vegetation recover from large-scale volcanic disturbance is critical for informing ecological restoration, disaster preparedness, and the application of deep learning methods in long-term environmental monitoring.

22 Looking for Signs of Anthropogenic Scarring in Maine Salt Marshes

Sophie Cronin ’26 | *Will Kochtitzky, Ph.D.*

GIS 210 Applications of GIS

Salt marshes across New England are experiencing both erosion and internal drowning, posing a risk to their ability to naturally retreat and accrete to escape rising seas. Historic factors like agricultural use and ditching have left New England salt marshes scarred and susceptible with difficult-to-detect damage. This project tested the use of LiDAR and land use data to locate areas of historic damage so future marsh restoration projects can target and repair our marshes successfully.

23 Tidal Synchrony as a Driver of Sharp-Tailed Sparrow Nesting Success: A Spatial Analysis

Weston Barker ’27 | *Will Kochtitzky, Ph.D.*

GIS 210 Applications of GIS

This GIS-based project explores how the breeding ecology and nesting success of “Sharp-tailed” (Saltmarsh and Nelson’s) Sparrows are tied to precise synchrony with regular flood tides in coastal Maine salt marshes. As ground-nesting species, the available time windows for these birds to breed are determined by the timing and height of tides during spring and summer. Elevation data and tidal information is used to map available nesting habitat and time periods throughout the breeding season.

24 Bike Route Analysis of Biddeford, Maine Using Geographic Information Systems

Wesley Hawley ’27 | *Will Kochtitzky, Ph.D.*

GIS 210 Applications of GIS

Using geographic information systems (GIS), I have created a bike route analysis of Biddeford, Maine. This locates the roads that would be best fit for a new bike lane, taking into account the road width, least cost path, as well as where popular destinations in the town are.

25 Mapping the Expansion of Invasive *Phragmites australis* in Scarborough Marsh Using Remote Sensing

Liberty Crow ’26 | *Will Kochtitzky, Ph.D.*

GIS 399 AI for Geospatial Problems

This project evaluates the expansion of the invasive reed *Phragmites australis* in Scarborough Marsh since its last mapping in 2019. Using 2023 NAIP aerial imagery and a convolutional neural network (CNN) classification approach, this study will identify current distributions of the species and compare them to previous spatial data. Results are expected to demonstrate increased spread into disturbed and roadside marsh areas.

26 What Factors Within the Foster Care System Contribute to Increased Vulnerability to Human Trafficking Among Foster Youth?

Alivia Faulkner ’26, Michael West ’26, Justyn Lopez ’26 | *Alicia Peters, Ph.D.*

ANT 312 Human Trafficking

We will cover the factors that contribute to the increased vulnerability of youth within the foster care system to human trafficking.

27 Temporal Changes in the Blooming of Leaves in the UNE 363 Woods

Jackson Martine ’27 | *Will Kochtitzky, Ph.D.*

GIS 210 Applications of GIS

The goal of this project is to answer the question of how increasing temperatures are impacting the timing of leaf out, the process of buds unfolding, within the UNE 363 woods. This will give an idea of how global climate change affects forests. Using daily satellite imagery from Planet Labs, the timing of leaf out between years beginning in 2017 are compared. The density of leaf out coverage within the 363 using a leaf area index for each identified date is digitized and quantified. As temperatures increase and temperature thresholds for the process are met earlier, it is likely that the timing of leaf out will shift earlier in the year.

28 Using Machine Learning to Predict Coral Reef Decline, Resilience, and Recovery

Isabelle Stiver ’26, Mason Gorrondona ’26, Hannah Bjerkness ’27, Jackson Martine ’27, Sydney Goldberg ’27 | *Jeri Fox, Ph.D.*

Anthropogenic ocean warming and acidification threaten coral reefs, often interacting to accelerate collapse. A key management question is whether synergistic stress events can be predicted to enable timely intervention and recovery. While individual resilience indicators are well studied, their combined effects remain difficult to model. Machine learning offers a promising approach to integrate diverse indicators into predictive frameworks, allowing classification of reef states and guiding conservation efforts toward systems with the highest likelihood of recovery.

29 Unraveling the Mystery of Rare Shell Coloration in Adult American Lobsters

Mason Gorrondona ’26, Claire Fecteau-Volk ’26 | *Markus Frederich, Ph.D.*

UNE has a collection of rare American lobsters *(Homarus americanus)*, including orange, blue, yellow, split, and calico individuals. This project investigates the genetic underpinnings of these rare colorations. Gene expression was assessed by qPCR for crustacyanin and showed significant downregulation in orange individuals. Transcriptomics will further describe differential gene expression in these animals.

30 A Novel Approach for Evaluating Coral Health: Analyzing Variations in Wavelength to Determine Fluorescence Ratios for Great Star Corals on the Mesoamerican Barrier Reef

Hanna Bjerkness ’27, Mason Gorrondona ’26, Tyler Janik ’27, Sydney Goldberg ’29, Dakota Schaum ’28, Michael West ’26, Veronica Kozak ’26, Thomas Garavelli ’27 | *Jeri Fox, Ph.D.*

As climate change intensifies, corals are increasingly susceptible to bleaching, disease, and mortality. Colonies with a greater percentage of fluorescing tissue and a variety of fluorescent proteins may better withstand thermal stress. We quantified the ratios of fluorescing tissues under UV and blue light treatments in the great star coral *(Montastrea cavernosa)* from images collected on Belize reefs. We aim to determine how stress affects coral, using fluorescence as an indicator of physiological resilience.

31 Epibenthic Communities in the Eastern Kitikmeot Region of the Canadian Arctic

Lydia Jones '26 | *Bodil Bluhm, Ph.D.*

BIO-2201 at UiT The Arctic University of Norway

Marine epibenthic organisms play a key role in ecosystems and serve as bioindicators due to their sensitivity to stressors and limited mobility. Understanding their community composition in the eastern Kitikmeot region of the Canadian Arctic is important as baseline data for environmental change. Taxon richness and abundance were estimated using seafloor imagery. Echinodermata had the highest richness and abundance, dominated by *Ophiocten sericeum*. Consistent substrates supported homogeneous communities, while variable substrates supported more heterogeneous epibenthos.

North2North

32 Classifying Fossil Potential Using a Spatial Analysis Model and Multispectral Imagery

Elijah Reulet '27 | *Will Kochtitzky, Ph.D.*

GIS 210 Applications of GIS

Fossil prospecting in remote regions can be costly and time-intensive. This study investigates whether GeoAI can identify spectral and spatial patterns in satellite imagery associated with high fossil potential, reducing the need for exhaustive ground surveys. A model was trained on known fossil localities and multispectral land cover data to produce predictive maps classifying areas by fossil density with the goal of guiding future fieldwork.

33 Remote Sensing of Dune Ecosystems: Evaluating CNN Performance for Coastal Vegetation Classification from UAV Imagery

Grey Trost ’27 | *Will Kochtitzky, Ph.D.*

GIS 399 AI for Geospatial Problems

Coastal dune ecosystems are incredibly ecologically important environments where the vegetation helps to stabilize the shoreline, making it more resilient. This project aims to develop a complex neural network (CNN), that is capable of accurately classifying dune grass. This will enable the mapping of past, present, and future locations of dunes and their vegetation, allowing us to better understand our shorelines and how to help them stay healthy.

34 Predicting Coastal Shoreline Change Using AI: A Storm-Driven Erosion and Accretion Model for New England Beaches

Nicolette Stamos ’27 | *Will Kochtitzky, Ph.D.*

GIS 399 AI for Geospatial Problems

Increasing storm intensity threatens coastal landscapes, making shoreline change prediction critical for effective management. This project uses NOAA buoy data, historical dune measurements from New England sandy beaches, and assistance from AI tools to predict erosion and accretion from storm conditions.

35 Detecting Shallow Coral Bleaching in the Florida Keys with Sentinel 2 Imagery and GeoAI Classification

Mark MacLellan ’27 | *Will Kochtitzky, Ph.D.*

GIS 210 Applications of GIS

I aim to assess shallow (<10 m) coral bleaching in the Florida Keys using Allen Coral Atlas habitat data, Sentinel 2 satellite

imagery, and GeoAI. Three maps will illustrate the area of interest, pre bleaching conditions, and bleaching extent over time. The reef area will be mapped in ArcGIS Pro, using existing habitat polygons, while GeoAI will classify bleached and non-bleached pixels in pre and post bleaching imagery to quantify patterns and temporal change across mapped reef areas.

36 Habitat Changes in Bobolink *(Dolichonyx oryzivorus)* Wintering Grounds of Bolivia: A Landsat-Based Land Cover Analysis

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

GIS 399 AI for Geospatial Problems

My project examines land-cover changes on the wintering grounds of six Bobolinks that were recaptured in 2025. Using Landsat imagery and a supervised Random Forest classifier, I will map and quantify the shifts in land cover across 100 km buffers around each wintering site from 2009 to 2024. MapBiomas 2024 land-cover data will show the most accurate and recent results. Land-cover changes can help predict potential causes for shifts in Bobolink wintering locations.

37 Quantification of Sand Accumulation Along Maine Jetties

Jacob Simmons ’27 | *Will Kochtitzky, Ph.D.*

GIS 210 Applications of GIS

Using height map data of the ocean floor, the accumulation of sand can be seen along jetties, which stop the natural flow of sediment. Using this data across time will show the total accumulation of sand from the first point.

38 Quantification and Identification of Rockweed, *Ascophyllum nodosum*, in the Coastal Regions of Downeast Maine and Maritime Canada Through the Use of a Convolutional Neural Network

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

GIS 399 AI for Geospatial Problems

Downeast Maine and the Maritime regions of Canada are very unique regions due to relationships of policy, boundary, community, and Rockweed, *Ascophyllum nodosum*. Because these bordering locations contain varying policies, it is vital to identify the abundance and locations of natural resources on which many of these communities are dependent. This project displays the abundance of rockweed in these intertidal regions through the use of Large Language Models and a Convolutional Neural Network.

39 Integrating Land Cover Data and Conserved Land Maps to Display Possible New England Cottontail Connectivity Corridors

John Montenegro ’27 | *Will Kochtitzky, Ph.D.*

GIS 210 Applications of GIS

This project will identify fragmentation between metapopulations of the New England Cottontail (NEC). By integrating Maine conserved land maps, contemporary NEC populations, and land cover datasets, I will perform a least-cost path analysis to identify connectivity between NEC metapopulations. The results can show possible locations for habitat restoration and potential introduction sites.

40 Mapping Land Use Change and Solar Development in Maine Over Time

Jonah Wolfe ’27 | *Will Kochtitzky, Ph.D.*

GIS 210 Applications of GIS

This project analyzes and maps changes in land over time where solar farms now occupy within the state of Maine. The Google Earth time stamp too was used to show land use change over time and solar farm data was collected from the ARCgis hub website. This analysis is important, as it is vital to plan sustainably for the future and use renewable energy while minimally affecting the land and environment around us.

41 Analyzing the Impact of Urbanization on Coastal Environments Using CNN Image Classification in Myrtle Beach, SC

Ethan Bombard ’27 | *Will Kochtitzky, Ph.D.*

GIS 399 AI for Geospatial Problems

This study investigates the relationship between urban development and coastal environmental change at Myrtle Beach, South Carolina from 1999 to present day. Landsat and Sentinel-2 satellite imagery will be classified using a convolutional neural network (CNN), land cover is classified into urban, vegetation, water, beach, and dune categories. Temporal analysis of these classifications aims to quantify how increasing urbanization has influenced beach morphology, shoreline erosion, and vegetation loss over the past two decades.

42 Wetland Loss and Endangered Bird Dependence Across Maine (2000–2020)

Annabella Lafond ’27 | *Will Kochtitzky, Ph.D.*

GIS 210 Applications of GIS

Wetland dependent birds rely on intact habitat, yet many Maine wetlands are under pressure. This project quantifies municipal wetland loss from 2000–2020 and tests whether population trends of state listed endangered wetland dependent birds track local wetland decline. DEP development records provide context for loss hotspots. Outputs include town level loss rankings and maps linking wetland change to bird population trends, offering evidence to guide conservation planning.

43 Identifying Priority Zones for Wildlife Crossings Through GIS-Based Crash Cluster Analysis

Bailey Gosse ’26 | *Will Kochtitzky, Ph.D.*

GIS 399 AI for Geospatial Problems

Human-made infrastructure reduces connectivity across habitats and environments, leading to unintended negative consequences for humans and animals, even for our National Park systems. Acadia National Park draws millions of visitors each year, leading to high traffic and use on the roads that surround and run through the park. This final project aims to identify high-traffic roads that interfere with wildlife, leading to car crashes and injuries, to protect both wildlife and humans.

44 Mapping Winter Thermal Regimes of Savannah Sparrows *(Passerclus sandwichensis)* Using ERA5 Climate Data and Unsupervised Machine Learning

Claire Huff M.S. '27 | *Noah Perlut, Ph.D., Will Kochtitzky, Ph.D.*

GIS 399 AI for Geospatial Problems

Grassland birds are the fastest declining group of birds in North America, yet many aspects of their nonbreeding ecology remain poorly understood. Using light-level geolocators, we identified wintering locations of *Passerculus sandwichensis* (Savannah Sparrow) from breeding populations in Vermont and New York across the eastern United States, Caribbean, and Central America. Wintering across a broad geographic range, individuals from the same breeding populations experience diverse thermal environments. Using ERA5 climate reanalysis data, we mapped winter thermal stability and applied unsupervised clustering to identify distinct thermal regimes across the nonbreeding region.

Hudson Valley Farm Hub

45 Mapping Canopy Cover in Maine to Assess Influence on the Distribution of Salamanders, *Hemidactylium scutatum*

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

GIS 210 Applications of GIS

Four-toed salamanders *(Hemidactylium scutatum)* were considered rare in Maine, but throughout the citizen science project Maine Big Night, they were found throughout the state. Many salamander species in Maine gravitate toward habitat with higher canopy coverage. I hypothesized that four-toed salamander sites are prominent in areas with tighter canopies. Using satellite imagery, I mapped canopy coverage in 100 meter buffers around the 0.3km Maine Big Night sites that had repeated sightings of four-toed salamanders.

46 Design and Trial of Nature Inspired Enrichment for Captive American Eels *(Anguilla rostrata)* Towards Stress Reduction: The Eel Enrichment Tree

Lillian Christopher ’27, Isabelle Tousignant ’26, Maxwell Bleyle ’26, Connor O’Brien ’27, Andrew Young ’26, Michael West ’26, Mark MacLellan ’27, Caitlin LaVallee ’27, Daniel Gallagher ’26, George Urquhart ’28, Nicolette Stamos ’27, Ethan Bombard ’27, Grey Trost ’27, Elijah Reulet ’27, Shea Leary ’27 | *Carrie Byron, Ph.D.*

MAR 350 Marine Ecology

To facilitate natural behaviors and reduce stress of captive eels, the “Eel Enrichment Tree” was conceptualized to mimic the structure of mangrove trees, providing root-like structures for the eels to engage in hiding behaviors. The habitat was built in the Makerspace, and an experiment was designed to evaluate the effectiveness of this habitat toward stress reduction and habitat enrichment, as observed through behavior, mortality, injury rate, food consumption, and cortisol levels.

47 Impact of Substrate Color on Settlement of *Ulva fenestrata* (Sea Lettuce) Spores

Daniel Gallagher ’26 | *Carrie Byron, Ph.D.*

Cultivation methodologies for *Ulva fenestrata* are currently in development, which involves adapting established Sea farming techniques that use twine as a substrate for seaweed nursery growth to better suit *Ulva*. *Ulva* spores exhibit negative phototaxis — movement away from light — when settling. Regional illumination due to the color of a substrate could therefore impact the number of spores a given substrate accumulates. This project measured the impact of substrate color on spore settlement within seaweed nursery conditions.

48 Occurrence of Small Cetaceans in the Gulf of Maine

Kara Mickiewicz ’27 | *Michelle Caputo, Ph.D.*

This project identified occurrence hotspots and modeled habitat suitability for small cetaceans in the Gulf of Maine. Ensemble models projected northward distribution shifts under future climate scenarios, with chlorophyll-a, temperature, and depth as key predictors. Under unsustainable pathways, highly suitable habitats largely disappeared. These findings highlight the vulnerability of cetaceans to climate change and show the importance of identifying current habitats to guide adaptive conservation.

49 Eelgloo: Innovative Habitat System Design for Improved Wellbeing of Captive American Eel *(Anguilla rostrata)*

Catriel Conroy ’26, Claire Fecteau-Volk ’26, Moe Kast ’26, Olivia Vaccaro ’26, Emilia Wilkins ’28, Hunter Redmond ’26, Kara Mickiewicz ’27, Lauren Beeman ’26, Lydia Jones ’26, Sarah Prokop ’26, Aria Yuengling ’26, Katie Miller ’26, Elizabeth Erskine ’27, Kevin Campbell, ’26, Grace Petley ’26, Isabella Parks 26’, Lucy Stevens ’26, Piper Stagg ’27, Beth Gera ’26 | *Carrie Byron, Ph.D.*

MAR 350 Marine Ecology

American eels *(Anguilla rostrata)* need habitat conditions that mimic their natural environment in order to thrive in captivity, which they currently lack within UNE’s tanks. We designed and built a structure, the “Eelgloo”, to provide habitat and structure in the tanks. We will examine the effectiveness of this structure against other habitat designs by observing swimming behaviors, time spent interacting with the structures, food consumption, and other indicators of stress reduction.

50 Exploratory Analysis of Wave Dynamics of the Saco Bay

Kevin Campbell ’26, Josephine Pikowski ’26 | *Charles Tilburg, Ph.D.*

Waves are the manifestation of energy traveling through water and are prone to changes based on their environment. Variation in wind speed, direction, bathymetry, and other oceanographic parameters change wave structure, height, period, and frequency. Wave structure determines the impact a wave exerts, and changes rates of coastal erosion, nutrient distribution, and informs maritime safety. This study aims to explore the wave structure of the Saco Bay to better understand the mechanisms responsible for their generation.

51 Evaluating a Three-Trophic IMTA System for Mitigating Algal Blooms

Lucy Stevens ’26 | *Jeri Fox, Ph.D.*

MAR 410 Marine Science Research

Nutrient accumulation in aquaculture systems can promote eutrophication and algal bloom development. Integrated Multi-Trophic Aquaculture (IMTA) has been proposed as a sustainable approach to recycle waste nutrients across trophic levels. This study experimentally compares a laboratory-scale three-trophic IMTA system containing shrimp, bivalves, and macroalgae with a shrimp monoculture control. Both systems were inoculated with an algal culture to simulate bloom conditions, and chlorophyll a, nutrient concentrations, and shrimp performance were monitored over four weeks.

52 Comparative Analysis of Gut Microbiomes Within Wild Caught vs Lab Reared Monogononta Rotifers

Beth Gera ’26 | *Patricia Thibodeau, Ph.D.*

Marine rotifers play an important role in aquatic ecosystems by consuming algae, being consumed by higher trophic organisms, and being used as food in aquaculture. Limited research exists surrounding the gut microbiome (the naturally occurring microbial gut community) within rotifers. The purpose of this research was to conduct a comparative analysis of microbiomes between lab reared and wild caught rotifers within the Saco Bay. Protocols were developed and executed to collect DNA samples, and amplified DNA will be sequenced to determine exactly what the microbial communities contain. Future results will be useful to understand how climate change has-and continues to-impact these organisms, as well as assessing their adaptive potential within the Saco Bay.

53 Envisioning Climate Futures through Climate Collaging Workshops

Allison Morse ’26, Elizabeth Erskine ’27 | *Jennifer Brousseau, Ph.D.*

As communities are experiencing climate change, transformative action is needed to adapt to current and future conditions. Through collaging workshops we aimed to explore how art visioning influences community adaptation. Through surveys and interviews aimed at measuring participant’s learning and behavioral intentions related to climate adaptation, we will assess the short- and long-term impacts of these workshops. Our research will aid in understanding how the process of creating and sharing place-based art fosters climate action.

UNE Funded Mini-Grant

55 Microplastic Recovery from Oysters: An Optimization of Extraction and Quantification Methods

Maxwell Bleyle ’26, Dakota Schaum ’28, Mikayla Straube M.S. ’26 | *Carrie Byron, Ph.D.*

This study optimizes microplastic recovery from oyster tissue through controlled spiking, chemical digestion, and filtration. Nile Red staining was applied to enhance fluorescence-based detection and quantification. Method validation included assessment of staining efficiency across three microplastic particle types. This approach refines extraction and visualization techniques, improving methodological consistency for microplastic analysis in oysters.

56 How Can Living Shorelines Be Implemented to Mitigate Sea Level Rise Impacts on Coastal Communities in Maine?

Edward Iannuzzi-Sucich ’27 | *Susan Farady, J.D.*

MAF 400 Marine Affairs Capstone

Sea level rise is a major consequence of anthropogenic climate change in coastal communities, as it can increase the intensity of flooding, erosion, and storms. Of the options available to homeowners to protect against sea level rise, living shorelines are the most effective at preventing erosion. My research demonstrates that living shorelines are also feasible from a cost and regulatory standpoint, making them a practical option to mitigate against sea level rise in Maine.

57 Bridging the Gap: Building Relationships and Gathering Community Perspectives on Regional Climate Action, Process, and Progress in Southern Maine

Annika Doeppers ’25, Edward Iannuzzi-Sucich ’27 | *Jennifer Brousseau, Ph.D.*

Our project examined the effectiveness of regional climate action planning in southern Maine through analysis of a climate action plan (CAP) cohort consisting of multiple municipalities. Various challenges, insights, and lessons learned were gleaned from interviews and qualitative online research during this process. Most notably, we found that the CAP process enhanced municipal climate action capacity, strengthened existing municipal relationships, increased public awareness of local climate action efforts, built regional momentum, and fostered peer learning.

UNE-GMRI Accelerator Grant, Maine EPSCoR SMART Grant

58 Mapping Changes at Laudholm Beach, Wells, Maine

Audrey Bobo ’27 | *Will Kochtitzky, Ph.D.*

GIS 210 Applications of GIS

This project analyzes spatial changes in major coastal cover types at Laudholm Beach from 2018 to the present using UAS imagery and GIS analysis. Annual orthoimagery is used to map the high-water line, dune vegetation, bare sand, and marsh/peat edges. Changes in shoreline position, vegetation coverage, and sediment distribution is quantified to identify patterns of coastal erosion or stabilization. The results produce multi-year maps and summary statistics to support coastal monitoring and management decisions at Wells NERR.

59 Urban Forestry Using GIS: Tree Inventory and Leaf-Out Timing in Biddeford, Maine

Alexis Weaver ’26 | *Will Kochtitzky, Ph.D.*

GIS 210 Applications of GIS; GIS 399 AI for Geospatial Problems

This project focuses on understanding Biddeford’s urban forest by combining a tree inventory with analysis of leaf-out timing. LiDAR and GIS methods are used to estimate tree count within Biddeford. Machine learning techniques help classify tree species and identify differences in when trees leaf out in spring. Results will show tree locations in Biddeford and leaf-out timing, helping to better understand environmental impacts and support future tree planting and management decisions.

60 Quantifying Salt Marsh Change in Scarborough Marsh Using Remote Sensing and Deep Learning

Erik Swenson ’26 | *Will Kochtitzky, Ph.D.*

GIS 399 AI for Geospatial Problems

Salt marsh degradation is increasing across the northeastern United States, yet spatial patterns remain poorly quantified. This study analyzes vegetation health, pool dynamics, and channel width changes in Scarborough Marsh using Landsat, Sentinel-2, and NAIP imagery from 2009–present. Convolutional neural networks will detect pools and channels to quantify changes in number, size, and morphology, while NDVI will assess vegetation trends. A geospatial workflow will be created to estimate tidal inflow using NOAA sea-level data.

Scarborough Land Trust

61 Do Dogs Out Bark Defense Lawyers? The Impact of Courthouse Facility Dogs on Witness Credibility

Evan Faulkner ’26 | *James Roche, Esq., LL.M, M.P.H.*

SOC 494 Capstone Thesis

This study assessed the effect of Court Facility Dogs (CFD) on jury bias. These dogs are used to support victim witnesses when testifying, most commonly child witnesses. To investigate this effect, we created three survey conditions, each containing a description of a child testifying in court, accompanied by a CFD, an adult attendant, or alone. We hypothesize there will be no significant effect of CFD use on perceived witness credibility, believability, likability, or defendant guilt.

62 The Effect of Tank Covers on Stress in Laboratory Zebrafish

Evan Faulkner ’26, Richie McGovern ’26, Griffin Kaplan ’26 | *Brian Greco, Ph.D.*

For this study, we investigated whether Zebrafish stress behavior and whether overall welfare and comfort is improved when tank covers are placed over standard laboratory tanks. Fear tests were conducted using a predator model to startle fish, and videos of tests were recorded. We hypothesized that when tank covers are placed on standard tanks, fish will be more dispersed, and display less darting behavior in response to the predator model.

UNE Mini Grant

63 Impact of Antimicrobial Peptides GF17, DIK, and WR-12 on Antibiotic Susceptibility and Integrity of Staphylococcal Biofilms

Winter Webb ’26, Myli Petrocci ’28, Erin Kang ’28 |
Kristin Burkholder, Ph.D.

Staphylococcus aureus is a bacterial pathogen that causes serious biofilm-associated infections that can be drug resistant. Here, we tested the effect of several antimicrobial peptides (AMPs) on antibiotic susceptibility and integrity of Staphylococcal biofilms and found that some AMPs improve the efficacy of existing antibiotics against staphylococci.

64 How Effective are Health Care Trainings in Educating Health Care Workers About Labor Trafficking?

Lindsey Provost ’26, Elaina Sarsfield ’26, Winter Webb ’26 |
Alicia Peters, Ph.D.

ANT 312 Human Trafficking

Health care providers are among the professionals positioned to identify individuals experiencing trafficking. Their ability to do so heavily depends on the quality and availability of proper training. Research suggests ineffectiveness of current human trafficking training for health care workers, which often tend to minimize emphasis on recognition of labor trafficking. While research highlights the overemphasis on sex trafficking, recent studies suggest a shift to become more balanced. Utilizing empirical studies and present educational interventions, we are evaluating how well these trainings can improve provider knowledge and ability to identify and respond to labor trafficking. With the already lacking interventions and awareness in clinical settings, the training models should effectively equip health care workers to recognize the entire spectrum of trafficking, as well as

build gaps and address the need for more emphasis on labor-trafficking awareness in training for clinical settings.

65 Dune Grass Recovery on the Coasts of Southern Maine

Lincoln Smith ’29, Bryan Corvelo ’27, Johanna Birchem ’26, Sophie Cronin ’26, Liz O’Brien ’29 | *Will Kochtitzky, Ph.D.*

Dunes are the first line of defense for the coast and coastal communities against storms that are getting more intense. Dune grass is what keeps the dunes intact, making the dune grass vital to the health of the coastline and the local communities. The goal of this research was to examine the recovery of dune grass and find the best method of planting dune grass to maximize the effectiveness of conserving the dune.

Maine Outdoor Heritage fund, Maine Coastal and Marine Climate Fund

66 Vernal Pool Ecology at the University of New England: Effects of Development and Water Chemistry on Breeding Amphibian Communities

Jamison Saunders ’26, Colby Bartlett ’26 | *Pam Morgan, Ph.D.*

ENV 311 Ecological Monitoring

This study uses long-term vernal pool monitoring data from the UNE 363-acre forest to examine how land development affects breeding amphibian use of vernal pools and how pH influences spotted salamander *(Ambystoma maculatum)* egg mass abundance across all surveyed pools.

67 Effect of Conductivity on Vernal Pool Wood Frog Egg Mass Numbers

Maxwell C. Caidric ’26, Rachel E. Mendez ’27 | *Pam Morgan, Ph.D.*

ENV 311 Ecological Monitoring

In 2010, development that took place at the University of New England impacted multiple vernal pools, raising concerns about potential ecological changes. This study was aimed to investigate the relationship between water conductivity and wood frog egg mass abundance within the impacted vernal pools, and to track the use of the pools by breeding amphibians over time.

68 Is There a Correlation Between Precipitation and Spotted Salamander Egg Mass Counts in Vernal Pools?

Emily Hinson ’26, Sam Hight ’26 | *Pam Morgan, Ph.D.*

ENV 311 Ecological Monitoring

Forming in late winter, vernal pools are sensitive, temporary habitats used by a wide range of threatened species. The University of New England is home to multiple vernal pools, including impacted, reference, and enhanced pools. These pools have been monitored since 2006 to identify changes that may occur within the pools. We investigated the effects of precipitation on spotted salamander egg laying. Less precipitation may result in fewer spotted salamander egg masses within the pools.

69 How Have Vernal Pools Been Affected by Development on the University of New England Campus?

Paige Thibault '26 | *Pam Morgan, Ph.D.*

ENV 311 Ecological Monitoring

The University of New England encompasses many vernal pools on campus and in the UNE 363-acre woods. Environmental students have conducted long-term ecological monitoring projects on specific vernal pools in order to gather data over time. Impacted vernal pool sites were compared to reference vernal pool sites, to understand the effects of development on the vernal pools, as well as how conductivity levels may affect the numbers of egg masses of Wood Frogs and Spotted Salamanders in the pools.

70 Examining Superfund Effectiveness in Marine Environments: A Case Study of New Bedford Harbor

Hailey Carr '26 | *Susan Farady, J.D.*

MAF 400 Marine Affairs Capstone

CERCLA has many flaws which can be highlighted in a case study of New Bedford Harbor. Superfund sites in marine environments are uniquely difficult to manage. I aim to highlight how the timeline and cleanup outcomes seen in New Bedford Harbor, demonstrate the strengths and weaknesses of federal superfund legislation.

71 A National Landscape of Climate Programs in Higher Education: A Deep Dive into the Distribution and Scope of Climate Change Degree Programs in the United States

Maura Klinowski ’28, Andrew Croteau ’28, Olivia Leighton ’27, Caitlin LaVallee ’27 | *Jennifer Brousseau, Ph.D.*

Universities and colleges can play a large role in shaping future generations to address climate change by promoting climate action and equipping students with the necessary knowledge and skills. This project examines the distribution of climate education in the United States (US) and aims to summarize the scope, geographic distribution, and trends over time of existing climate change higher education undergraduate and graduate programs.

David E. Shaw Innovation Fellowship

72 What is a “Climate Change” Degree? Exploring the Missions and Curriculum of Climate Degree Pathways in the United States

Olivia Leighton ’27, Maura Klinowski ’28, Andrew Croteau ’28, Caitlin LaVallee ’27 | *Jennifer Brousseau, Ph.D.*

Universities and colleges can play a large role in shaping future generations to address climate change by promoting climate action, and more programs have begun to provide specific climate education programs to equip students to address these issues. In this study, we build off an existing review of climate change higher education programs at institutions in the United States to focus specifically on the missions/goals and curriculum of these programs.

David E. Shaw Innovation Fellowship

73 Predicting Nearshore Wind Vectors from Offshore Observations in the Gulf of Maine.

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

This project examines the relationship between wind speed and direction measured at two weather buoys in the Gulf of Maine, one located at the Girard Marine Science Center and another approximately 15 km northeast, offshore of Portland, Maine. Linear regression models were developed to predict wind components at the coastal station using offshore observations, providing insight into the potential for offshore data to estimate nearshore wind conditions.

74 Biofilter and Denitrification Efficiency in a Recirculating Aquaculture System Housing American Eel *(Anguilla rostrata)*

Audrey S. Fox ’26, Ruby J. Kimball ’26 | *Michael Galloway, M.S.*

ENV 495 Advanced Environmental Internship

Recirculating aquaculture systems are delicate environments that require consistent upkeep and monitoring. In particular, Nitrifying bacteria are reliant on a stable alkalinity levels input of ammonia to remove nitrogenous waste from the water. Total Ammonia Nitrogen (TAN) samples were taken from a system housing American eels *(Anguilla rostrata)* both pre and post feeding. Total ammonia nitrogen was recorded and compared for consumption rate over time. Both R and Python were used to process and visualize the data.

75 Diffusion-based Modeling of Coastal Erosion with Spur Jetty Effects

Ruby Kimball ’26 | *Emily Kelting, Ph.D.*

Camp Ellis, Maine has experienced significant coastal erosion due to jetty construction and altered sediment transport. A diffusion-based PDE is used to model shoreline change,

with boundary conditions representing coastal structures, including a spur jetty. This project models shoreline change by separating it into stationary and time-dependent components to account for diffraction, and evaluates how a spur jetty can affect shoreline stability.

Maine Outdoor Heritage Fund

76 Deployment and Monitoring of Wave Buoys off Camp Ellis and Biddeford Pool

Elizabeth O'Brien '29, Lincoln Smith '29, Johanna Birchem '26, Sophie Cronin '26, Bryan Corvelo '27, Jasmin Townsend-Ng '26, Liam Harris '28 | *Will Kochtitzky, Ph.D., Carrie Byron, Ph.D., Emily Kelting, Ph.D., Lisa Herschbach, Ph.D., and David Plavin*

Intensified storm surges and waves caused by climate change has put the economy and environment of coastal communities in Saco Bay. University of New England faculty and students deployed two Spotter Buoys to monitor wave height, direction, period, and length. The data collected from the Spotter Buoys has shown how waves and storms in the Gulf of Maine are changing and can inform decisions on coastal preservation.

National Science Foundation EPSCoR, Maine SMART

77 What Role Does Stigmatization and Victim Blaming Play in Survivors' Service Delivery Experiences?

Abigail Rose '26, Averi Curran '27, Andy Young '26 | *Alicia Peters, Ph.D.*

ANT 312 Human Trafficking

This research project focused on the effects that stigma and victim blaming have on the experiences of human trafficking suvivors who seek services.

78 What Role has the US Military Played in Human Trafficking?

Brandt Goodfriend ’26, Andrew Lemieux ’26, Leah Underwood ’26 | *Alicia Peters, Ph.D.*

ANT 312 Human Trafficking

We will cover the roles of the US military in facilitating and combating human trafficking. Including the repercussions and the lack thereof. There will be a special focus on the historic pattern of the military’s involvement in sex trafficking across the world. We will also discuss the exploitative power dynamic between the troops and the trafficking victims.

79 Bride Trafficking in China: Examining an Underreported Issue

Sarah LaVita ’26, Emily Buchter ’26, Kiley Rolfe ’27 | *Alicia Peters, Ph.D.*

ANT 312 Human Trafficking

This research will answer the question: How do demographic imbalance, gender inequality, and economic conditions contribute to the persistence of bride trafficking into China?

80 The Intersection of Human Trafficking and Substance Use: The Implications of Substance Use Before, During, and After Being Trafficked

Emily Otte ’26, Tralee Pomerleau ’26, Laurel Mason ’27, Kaitlyn Masson ’26 | *Alicia Peters, Ph.D.*

ANT 312 Human Trafficking

We examine the intersection of human trafficking and substance use, and the implications of substance use before, during, and after individuals are trafficked. Some include barriers to resources, risks for many health issues, and the return to usage. We recognize the complexity of this

relationship by promoting prevention, policy changes, and providing examples of resources for victims and survivors.

81 Impacts of 10 ppb Embryonic Exposure to Arsenic on *Danio rerio* Stress and Emotional Responding in Both Embryos and Adults

Gabriel Stoehr ’26, Tyler McGoldrick ’26 | *Michael Burman, Ph.D.*

Arsenic is a metalloid found in drinking water with an EPA safe drinking limit set at 10 ppb. Current evidence suggests that exposure to even this “safe” level can have lasting neurotoxic effects relating to anxiety and stress tolerance. When combined with early life stress, these impacts may be amplified. We examined the role of cortisol signaling on the impacts of arsenic, ELS, or a combination of both on behavior in embryos and adults.

NIH Grant: 1R21ES035818

82 Physiological Effects of Tactile and Olfactory Soil Exposure on Anxiety

Samantha Quatrano ’28, Ashlyn Bouchard ’27 | *Ursula Roese, Ph.D., David Sandmire, M.D.*

BIO 210 Introduction to Biological Research

This study examines the physiological effects of tactile and olfactory soil exposure on anxiety. Participant trials have begun, and this presentation reports preliminary findings from early data collection. Initial results indicate that heart rate variability and self-reported anxiety measures are feasible, non-invasive, and responsive to soil exposure. These findings support the continued use of these methods as data collection proceeds in ongoing trials.

83 Temperature Stability and Distribution of Compounds in the Brown Alga *Fucus vesiculosus* with Antimicrobial Properties Against Gram-positive Bacteria

Ethan Case '28 | *Ursula Roese, Ph.D.*

BIO 410 Biological Sciences Research

Fucus vesiculosus, a brown macroalgal species on the rocky intertidal coast of Maine was explored as a source of bioactive compounds. This research focuses on the potential use of these compounds against three gram-positive microbes, deemed priority pathogens in regards to the need for antibiotic development by the World Health Organization. These three microbes include methicillin-resistant *Staphylococcus aureus* (MRSA) strain USA300, methicillin-sensitive *Staphylococcus aureus* strain Newman (MSSA), and *Staphylococcus epidermidis*. Methanol extracts were prepared from algae and antimicrobial properties were then evaluated in a disk assay. Extracts showed antimicrobial activity against all three pathogens. This antimicrobial activity was more pronounced from extracts of the thallus compared to reproductive parts of algae. In addition, antimicrobial activity could be extracted by submersing algae in solvent for a short time indicating that they are associated with the surface of algae. Antimicrobial compounds were further tested for their storage temperature stability by comparing -80°C, -20°C, +4°C, and room temperature.

84 Reading Still Wins: The Central Role of Working Memory in Modality-Based Comprehension

Ella Murthi ’26, Natalie Higgins ’28, Trinity Huff ’26 | *Jennifer Stiegler-Balfour, Ph.D.*

This study examined how ADHD symptoms and working memory capacity predict reading comprehension across three presentation conditions. Participants showed the highest comprehension when reading, followed by Reading-while-listening (RWL), and the lowest while listening. Multiple regression analyses revealed that working memory capacity significantly predicted recognition scores demonstrating that listening and RWL may impose greater demands on working memory than reading alone. Overall, results highlight the central role of working memory in modality-based differences in comprehension.

85 A Wheel Good Time — The Effects of Enrichment on Laboratory Mice

Isabelle Giacomozzi ’29, Robert Berlage ’28, Alexis Schultz ’29 | *Brayden Wesler, Victoria Eaton ’18, Jared Zuke, Denise Giuvelis, M.S.*

Laboratory mice typically have simple cages, but a more enriching environment may increase physical and mental well-being. We assessed spatial and social anxiety, as well as physical strength by introducing a running wheel enrichment to the home environment. To evaluate well-being, we utilized the elevated plus maze, social interaction test, grip strength, and qualitative observations. We predicted that enrichment would decrease anxiety like behaviors and increase physical strength, which could positively impact future research animals.

NIGMS grant # P30GM145497

87 Examining a Potential Mechanism for Paternal Kin Recognition in Eastern Chimpanzees *(Pan troglodytes schweinfurthii)*

Claire Isabelle ’27 | *Maggie Stanton, Ph.D.*

In multi-male, multi-female group-living species promiscuous mating is thought to reduce infanticide risk by increasing paternity uncertainty. However, studies have found evidence of paternal kin recognition in promiscuous primate species, including chimpanzees. That said, the mechanism fathers use to recognize their offspring remains unclear. Using long-term behavioral data, this study aims to investigate whether chimpanzee males use a “behavioral rule-of-thumb” by determining whether male behavior with mothers around the conception predicts subsequent male-infant interactions.

88 Vinculin is Pro-Nociceptive in *Drosophila melanogaster* Larvae

William Harriman M.S. ’27, Lily Jones ’28, Justin Hindley ’26 (USM) | *Julie Moulton M.S., Geoffrey Ganter Ph.D.*

Abnormal pain continues to be a clinical problem. Vinculin, a protein in the Epidermis-Nociceptor Adhesion Junction, has shown signs of potentially playing a role in pain signaling. Vinculin was reduced in larval nociceptors, and their pain sensitivity was measured by exposing them to noxious stimuli such as pressure and heat. Knockdown via two non-overlapping Vinculin RNAi tools resulted in significant hyposensitivity. This indicates that Vinculin plays a pronociceptive role in pain signaling in *Drosophila*.

NIH Grant: R15NS131952

89 Effect of Antimicrobial Peptides IDR-1018 and RI-10 on Viability of *Staphylococcal* Biofilms

Juliana Miguel ’27 and Andrew Cole ’26 | *Kristin Burkholder, Ph.D.*

Staphylococcus aureus causes serious biofilm-associated infections that can be drug resistant. Antimicrobial adjuvants are compounds that can increase the efficacy of existing antibiotics. Antimicrobial peptides (AMPs) exhibit adjuvant activity against non-biofilm-resident staphylococci, but whether they aid antibiotic activity against *staphylococcal* biofilms is unclear. Here, we tested the effect of AMPs IDR-1018 and RI-10 on antibiotic susceptibility *Staphylococcal* biofilms in an effort to understand if these AMPs could serve as novel anti-staphylococcal therapeutics.

90 Microheterogeneity in Water + Cyclic Ether Liquid-Liquid Mixtures and its Role in Solute Aggregation

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

Aryl-functionalized siloles dissolved in tetrahydrofuran or 1,4-dioxane can exhibit substantially increased fluorescence behavior when they undergo aggregation through additions of water to their solvent environment. In this work we aim to understand the structural changes the solvent environment undergoes by investigating various proportions of water and cyclic ether using molecular dynamics simulations.

91 Assessing Spatiotemporal Changes in Saco River Biogeochemistry

Esmé Jamison ’26, Lillian Westerberg ’27 | *Patricia Thibodeau, Ph.D.*

This study aimed to determine spatial and temporal changes in temperature, salinity, nutrients, water clarity, and

carbonate chemistry from long-term (2002-2024) data sets collected at two stations along either end of the Saco River. Results from this project will increase understanding of the biogeochemistry that influences the base of the food web and how the physical and chemical characteristics of the Saco River have changed over time.

92 α-Catenin Promotes Nociception in the *Drosophila melanogaster* Primary Nociceptor

Luke Jenkins ’26, Tatiana Muteba, Justin Hindley ’26 (USM) | *Geoffrey Ganter, Ph.D.*

Abnormal pain is a serious problem. The WG/Wnt signaling pathway plays a vital role in neuronal development and synaptic function. Using *Drosophila* larvae and the Gal4/UAS-RNAi system, this study explored the possibility that WG/WNT pathway component α-Catenin helps to control nociceptive sensitivity. Using multiple RNAi tools, results showed that underexpression of α-Catenin led to nociceptive thermal and mechanical hyposensitivity. This suggests that α-Catenin is pronociceptive and may represent an effective target for drugs reducing abnormal pain.

NSF EPSCoR E-CORE RII award #2412130 and NIH award 1R15NS131952

93 Chow Down: A Comparative Study of Mouse Food Preferences

Aly Manzoni-D’Arpino ’28, Kayla Handi ’28, Siena Lauze ’29 | *Brayden Wesler, Victoria Eaton ’18, Jared Zuke, Denise Giuvelis, M.S.*

Food preference of laboratory mice is important for conducting motivational behavioral research tests. Mice are known to show a preference for the color blue and strong odor. Therefore, a three-food preference test was conducted utilizing standard chow, blueberry, or peanut butter. Animals were introduced to each food option and subsequently

allowed to freely explore all food options. We hypothesized that the mice will show preference towards peanut butter due to its texture and strong odor.

NIGMS grant # P30GM145497

94 Historical Metadata Trends of the Saco River: 2022–2025

Casey Labrie ’27 | *Charles Tilburg, Ph.D.*

Estuaries are classified into four types based on freshwater discharge, tidal forcing, and wind-driven mixing. This study analyzes four years of tidal height, wind, and freshwater discharge data from the Saco River Estuary to characterize physical forcing conditions and identify optimal windows for CTD sampling. Data was processed in R and will directly inform future field campaigns aimed at collecting salinity and temperature profiles needed to formally classify the Saco River Estuary and better understand how small, seasonally variable estuaries respond to changing environmental conditions.

95 Investigating the Role of Cadherin E in *Drosophila melanogaster* Nociceptors Utilizing the Gal4/UAS-RNAi System

Kaia Anderson ’28, Lyla Levesque ’28 | *Geoffrey Ganter, Ph.D.*

Uncontrolled pain is a significant clinical problem. Because *Drosophila*’s pain signaling pathways are genetically similar to humans, CadE expression was reduced in *Drosophila* nociceptors using the GAL4/UAS-RNA interference system, and mechanical pain sensitivity was measured. No significant change in pain sensitivity was observed. These results suggests that CadE may not be a major contributor to pain regulation in the nociceptor, and future experiments will focus on other members of the Cadherin family.

NIH Grant: R15NS131952-01

96 Beyond the Breed: Relationships Between Participant Gender, Dog Breed Stereotypes, and Human Comfort

Bobby Berlage ’28, Natalie Higgins ’28, Taya Lawrence ’28, Emily Machinski ’28 | *Jennifer Stiegler-Balfour, Ph.D.*

PSY 285 Research Methods

Various breeds of canines have been the subject of great scrutiny regarding aggression levels, impacting individual’s perceptions of safety and comfort level. Through surveys of undergraduate students, the current study observes the relationships between an individual’s gender identity and stereotyped aggressive or nonaggressive canine breeds, in order to investigate the individual’s perception of comfortability with that canine.

97 Teaching Fish to Read: Conditioning Zebrafish to Clear Signaling Paradigms

Hadli Nate ’26, Taya Lawrence ’28 | *Brian Greco, Ph.D.*

In managed environments, animals rely on non-naturalist signals derived from humans. These anthropogenic signals lead to the development of abnormal behaviors, which have the potential to heighten stress and anxiety in captive animals. Specifically, laboratory zebrafish live in barren tanks where anthropogenic cues dominate the environment. The goal of our study is to replace the anthropogenic cues with clear signaling paradigms. We tried four different approaches: group conditioning, individual conditioning, and two social learning scenarios.

UNE Mini Grant

98 Changes in Biomarker-Identified Cell Populations Following Neonatal Pain and Stress in a Rat Model

Sydney Pelletier ’26, Casey Norton ’26 | *Michael Burman, Ph.D.*

Early life pain and stress have consequences on the development of neurobiological pathways involved with fear and anxiety in the amygdala and hypothalamus, leading to altered susceptibility to anxiety and chronic pain later in life. This study examines the effects of early life pain on bio-marker identified neuronal populations. We will present preliminary tissue quantification results using RNAscope HiPlex on pd 24 male and female brains for neonatal manipulation and control treatments.

This project was funded by NIH: R16GM153598 and utilized the imaging and histology core facility funded by P30GM145497.

99 The Effect of Early Life Pain on the Activation of the Amygdala and Hypothalamus in Rats

Joshua Paraskos ’26 | *Michael Burman, Ph.D.*

Infants in the neonatal intensive care unit (NICU) undergo lifesaving procedures that can be painful. In this study, we investigate the correlation between early-life pain and disorders such as anxiety and pain hypersensitivity by simulating a NICU environment and a later stressor: pricking the hindpaw of rats during the first 7 days of life, followed by fear conditioning at 21 days, then performing IHC for immediate early gene products to track amygdalar and hypothalamic activation.

Kahn Family Foundation, NIH

100 Biomechanics of Push Ups: Applying Physics Principles to Upper Body Strength

Devin Brodeur ’27, Alberto Zepeda ’26 | *Mayuri Gilhooly, Ph.D.*

PHY 125 Introduction to Biomechanics

Push-ups are a common exercise used to develop upper body strength and provide a useful system for studying biomechanics. We analyze push-up motion using physics principles including force and interaction diagrams, Newton’s laws, torque, kinematic stacks, and range of motion (ROM). Video analysis tracks center-of-mass motion, force plates measure interaction forces, and a goniometer measures elbow ROM. Phyphox smartphone data and AI-assisted analysis generate additional motion graphs to support applications in exercise science and occupational therapy.

101 Step by Step: The Biomechanics of Walking, Shuffling and Cane Assisted Gait

Nicole Poltack ’27, Katie Blanchard ’26 | *Mayuri Gilhooly, Ph.D.*

PHY 125 Introduction to Biomechanics

This project examines the biomechanics of walking, shuffling, and cane-assisted gait using physics principles including center of mass, base of support, ground reaction forces, friction, and range of motion (ROM). Force plates measure interaction forces during walking without a cane, walking with a cane, and shuffling. A goniometer measures joint ROM, while force and interaction diagrams illustrate Newton’s laws. Video analysis and Phyphox smartphone data are compared, and AI-assisted tools generate additional motion graphs to analyze gait stability relevant to occupational therapy.

102 Sit-to-Stand Biomechanics: Investigating Functional Mobility at Different Seat Heights

Meghan Mefford ’27, Julia Finn ’27 | *Mayuri Gilhooly, Ph.D.*

PHY 125 Introduction to Biomechanics

This project analyzes the biomechanics of sit-to-stand movements at varying seat heights using physics principles including forces, Newton’s laws, center of mass, and interaction diagrams. Video analysis tracks center-of-mass motion to construct kinematic stacks during the sit-to-stand transition. Force plates measure forces on the seat and feet, while a goniometer measures knee joint range of motion. AI-assisted tools support data analysis and graph generation to examine functional mobility relevant to occupational therapy practice.

103 Slip or Safe? Exploring Fall Prevention Through Physics

Stella Bianchi ’27, Ayden Parrish ’27 | *Mayuri Gilhooly, Ph.D.*

PHY 125 Introduction to Biomechanics

This project examines fall prevention and bathroom safety through the physics principle of friction. We investigate how different surfaces, such as smooth tile and carpet, affect slipping during everyday movements. Force sensors measure friction across surfaces, while interaction and force diagrams illustrate Newton’s laws and interaction pairs. AI-assisted tools are used to support data analysis. The project highlights how understanding friction informs safety interventions in occupational therapy.

104 Examining Board of Directors and Staff Culture and Retention in a Small Non-Profit in Maine

Zoe Lambke ’26 | *Sarah Ebel, Ph.D.*

ENV 410 Environmental Research

I chose to research the culture and retention of the board of directors and staff in a small non-profit in Maine because of the lack of firm data gathered within this organization regarding this topic. I conducted a Culture and Engagement Survey to look into the board of directors, as well as Exit Interviews for those leaving the organization. Pulling together this information assists in continuing the longevity of the non-profit.

105 Linear and Rotational Motion in Wheelchairs: A Physics Analysis of Stability and Mobility

Charlotte Hosterman ’27 and Laina Scanlan ’27 | *Mayuri Gilhooly, Ph.D.*

PHY 125 Introduction to Biomechanics

This project examines wheelchair motion and stability using physics principles including linear and rotational motion, center of mass, base of support, line of gravity, forces, and Newton’s laws. Force plates measure interaction forces during wheelchair propulsion, while a goniometer measures shoulder joint range of motion. Video analysis using motion-tracking software is used to analyze center-of-mass motion during movement. Interaction and force diagrams illustrate the underlying physics. AI-assisted tools support data analysis and graph generation to evaluate wheelchair stability and mobility relevant to occupational therapy practice.

106 Analyzing Shifts in Zooplankton Biomass Across Spatiotemporal Gradients in the Gulf of Maine

Julia Hobbs ’27, Shea Leary ’27, Jessie Mahowald ’28 | *Patricia Thibodeau, Ph.D.*

Zooplankton are a key component of marine food webs and serve as indicators of ecological health. Zooplankton community composition, diversity, and biomass provide insight into how environmental changes are affecting food webs, energy transfer to higher trophic levels, and carbon transport in the ocean. This project combines in situ observations with satellite data to examine how environmental factors, including chlorophyll-a and temperature, influence zooplankton communities, resulting in broader implications throughout the Gulf of Maine ecosystem.

Maine Space Grant Consortium

107 Photophysical Investigation of a Tris(salicylideneaniline) Derivative and its Potential Aggregation-Induced Emission Behavior

Joshua Gantert ’26 | *Jerry Mullin, Ph.D., Aylin Aykanat, Ph.D.*

CHE 410 Research I

Aggregation-Induced Emission (AIE) is described as enhanced luminescence resulting from molecular aggregation, well-characterized in Group-14 metalloles through restricted intermolecular rotations. This study investigates whether a tris(salicylideneaniline) derivative exhibits AIE in THF/water systems. A modest emission increase was observed at 0–50% water fractions, followed by quenching and a red shift at higher water fractions. These aggregation-related behaviors are compared to AIE-active metalloles to assess whether tris(salicylideneaniline) exhibits similar photophysical characteristics.

108 Abundance of the Guiana Dolphin *(Sotalia guianensis)* in Inshore Waters Surrounding Costa Rica

Jillian Bender '27 | *Michelle Caputo, Ph.D.*

Estimating population size is vital for conserving coastal cetaceans under human pressure. This study assessed Guiana dolphin abundance in Costa Rica using photo ID and mark-recapture modeling across 2023–2024 surveys. Identifiable individuals were estimated at 47.94 (±0.55 SE), with a total population of 69.45 (±6.25 SE). Increasing recaptures and fewer new individuals suggest effective sampling, providing a baseline for future conservation efforts.

2025 Doug and Lauren Sanford Marine and Environmental Science Fellowship Fund

109 Climate-Driven Shifts in the Ecology and Movement Patterns of Atlantic White-Sided Dolphins in the Gulf of Maine

Harley Dyer '26 | *Michelle Caputo, Ph.D.*

This presentation explores how climate change is reshaping the ecology and movement patterns of Atlantic white-sided dolphins *(Leucopleurus acutus)* in the Gulf of Maine. By examining long-term trends in habitat use and foraging behavior alongside environmental change, this study highlights how shifts in ocean conditions influence predator distribution. As indicators of ecosystem health, changes in dolphin movements provide insight into broader alterations in marine food webs in a rapidly warming ocean.

110 Saline Agriculture: Growing Vegetables in a Saltwater Hydroponic System

Samantha Moronta ’29 | *Jeri Fox, Ph.D.*

MAR 399 Special Projects in Aquaculture, Aquarium Science, or Aquaponics

The changing of our environment requires adaptations to sustain the human race. With the depletion of viable soils and freshwater, one of the biggest questions we will face in the near future pertains to how we will access food. There has been extensive research on the potential of soil conditioners to mitigate saline soils, but little research on how it can mitigate saltwater. This project aims to apply these concepts to a saltwater hydroponic system.

111 Impact of Microplastics on Microbial Colonization of Oysters

Abigail Vigue M.S. ’26, Tyler Janik ’27, Madison Westrich ’28 | *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 exposed oysters to bacteria alone, bacteria bound to plastic microfibers, or bacteria bound to natural microfibers and we monitored bacterial and microfiber uptake and retention in oyster tissues. Data from this project will aid our understanding of potential threats posed by microplastics to the human food supply.

Maine Sea Grant

RESEARCH TALKS

LEGEND

The Gulf of Maine: A Looking-Glass into Anthropogenic Climate Change

Student Author(s)

Lydia Pinard '22 | *Charles Tilburg, Ph.D.*

Faculty Advisor(s)

ENV 262 Gulf of Maine Field Studies

Course

Abstract

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.

Decary 208 | 2:15 p.m.

Presentation Location and Time

Funded by

Maine Space Grant Consortium, UNE SURE Program

The Politics of Banning Books in the 21st Century: The Case of Toni Morrison's The Bluest Eye

Callyn Eon '26 | *Ali Ahmida, Ph.D.*

PSC 491 Integrative Essay

Why are books being banned in schools and what are the social and political factors involved? Why now? Why is a prominent book, The Bluest Eye, by Nobel prize-winning American author Toni Morrison being banned in the United States?

Decary 203 | 1:00-1:20 p.m.

The Politics of Climate Change and the Advocacy of Denial

Jacqueline Doane '26 | *Ali Ahmida, Ph.D.*

PSC 491 Integrative Essay

Despite extensive scientific evidence of human activity influencing climate change, U.S. policy, rhetoric, and political actions do not reflect the scientific findings and instead push towards denying climate change science even though the effects are becoming more costly and lethal. My thesis will examine the connection between mass media, public perception, and government action. To concentrate my research, I will be focusing on two cases, Fox News Media, and the Environmental Protection Agency (EPA).

Decary 203 | 1:25-1:45 p.m.

Echoes of Apartheid: South Africa and the Politics of Genocide in Gaza

Lily Furtado '26 | *Ali Ahmida, Ph.D.*

PSC 491 Integrative Essay

This integrative thesis critically examines the Gaza crisis through a comparative analysis with apartheid South Africa, exploring how legal frameworks of genocide and apartheid are variably

interpreted, contested, and often strategically obscured. Integrating legal analysis, historical comparison, and media discourse, it reveals how power structures shape the recognition of mass violence. By situating South Africa's ICJ intervention within its historical experience, the study illuminates the moral and political limitations of contemporary human rights enforcement.

Decary 203 | 1:50-2:10 p.m.

Beyond the Mainland: What Coastal Island Communities Reveal About Class Culture and Identity in American Societies

Molly Lunt '26 | *Ali Ahmida, Ph.D.*

PSC 491 Integrative Essay

The topic for my thesis is centered around the early settlement of my family on an island off the coast of Maine, Frenchboro. It would involve a deep dive into not only my family history but also into an understanding of colonialism and settlement. Examining what is overlooked in understanding and appreciating local regional communities and culture, i.e, coastal island communities in Maine?

Decary 203 | 2:15-2:35 p.m.

Differences and Disabilities: American Education and the Politics of invisibility

Phoebe Carrona '26 | *Ali Ahmida, Ph.D.*

PSC 491 Integrative Essay

Senior thesis for political science; the American education system representation of students with disabilities (learning disabilities/differences).

Decary 203 | 2:40-3:00 p.m.

Catholicism, Islam, and Intersectional Feminism in Ireland and Morocco: A Fatema Mernissi and Sinéad O'Connor Study

Tralee Pomerleau '26 | *Ali Ahmida, Ph.D.*

PSC 491 Integrative Essay

This research paper compares the lives and work of Fatema Mernissi and Sinéad O'Connor in relation to religion and feminism. It examines how both of these women have challenged, reinterpreted, and/or accepted religion in their views and ideas of feminism.

Decary 203 | 3:05-3:25 p.m.

Presence of Rival Mating Call on Male House Cricket *(Acheta domesticus)* Behavior

Heather Marvin '26, Stella Libby '27, Gracie McNally '26 | *Maggie Stanton, Ph.D.*

ANB 425 Advanced Methods in Animal Behavior

Previous research shows that male crickets use acoustic signaling when in the company of females to compete with rivals. This study looks at how the distance of a rival male's mating call affects a male cricket's behavior when in the same area as a female. We hypothesize that the male crickets will change their song immediately (reduce or silence) when detecting a competitor in their acoustic space.

Decary 205 | 1:00-1:20 p.m.

Chemical Cue Recognition and Antipredator Behavior in House Crickets *(Acheta domesticus)*

Ashley Araneo ’26, Samantha Peterson ’26, Jaylyn Bartolome ’26 | *Maggie Stanton, Ph.D.*

ANB 425 Advanced Methods in Animal Behavior

Evidence suggests house crickets (Achete domesticus) can use chemical signals to identify predators. This study tested if crickets can differentiate between predator species, non-predator species, and neutral stimuli. We examined how antipredator behavior, such as freezing, bursts of speed, voluntary limb loss, and avoidance, is exhibited in the presence of the chemical signals. It is predicted that crickets exposed to predator cues will show increased antipredator behaviors compared to other groups.

Decary 205 | 1:25-1:45 p.m.

Impact of Auditory Predator Cues on Environmental Preference of House Crickets *(Acheta domesticus)*

Bronte Wise ’26, Evan Faulkner ’26, Katerina Van Steele ’26 | *Maggie Stanton, Ph.D.*

ANB 425 Advanced Methods in Animal Behavior

Literature suggests crickets can hear and react to bat predator calls. We investigated whether the presence of an auditory predator cue affects the proportion of time house crickets spend in a light versus dark environment. We hypothesize that all crickets will spend the majority of their time in the dark environment, however crickets exposed to auditory predator cues will spend more time in the dark environment than those not exposed to auditory cues.

Decary 205 | 1:50-2:10 p.m.

Memory of Predation Threat in *Acheta domesticus*

Megan Burns ’26, Eden Sidman ’26, Katherine Kimball ’26 |
Maggie Stanton, Ph.D.

ANB 425 Advanced Methods in Animal Behavior

Research shows that crickets rely on olfactory cues to assess predation threat. They have also displayed behavior suggesting a reliance on memory to reduce the risk of predation. Based on those results, we expect that domestic house crickets *(Acheta domesticus)* repeatedly exposed to an area with rat feces can learn to associate that area with a predation threat and will remember to avoid it, even when those feces are no longer present.

Decary 205 | 2:15-2:35 p.m.

Differences in Scent Aversion Between Male and Female Crickets (Acheta domesticus)

Sarah Goble ’26, Kensington Jerome ’26, Eden Morris ’26 |
Maggie Stanton, Ph.D.

ANB 425 Advanced Methods in Animal Behavior

Previous research has shown that essential oils are aversive to house crickets, but little is known about the degree of scent aversion and differences between male and female crickets. Our study recorded cricket movement in a four-quadrant choice test using different essential oils paired with food to determine which scent was the least aversive across male and female trials. We hypothesized that when seeking food, male cricket scent aversions will differ from females.

Decary 205 | 2:40-3:00 p.m.

Microwave Chemistry Meets Resin Catalysis: Exploring Modern Approaches to Sustainable Organic Synthesis

Marisa Crowley ’27 | *Amy Deveau, Ph.D.*

CHE 410 Research I, CHE 251 University Organic Chemistry II

Microwave irradiation promotes greener synthesis of organic compounds. Common outcomes of microwave application include shorter reaction times, higher conversion, and increased percent yield. In this talk, the value of merging microwave chemistry with resin-based catalysis will be explored in view of ongoing research on the synthesis of coumarin derivatives.

Decary 207 | 1:00-1:20 p.m.

Interstitial Shelter Availability as a Limiting Factor for Juvenile Atlantic Salmon *(Salmo salar)* in Maine’s Coastal Rivers

Audrey S. Fox ’26 | *John Kocik, Ph.D., Ernie Atkinson, M.S.*

Atlantic Salmon *(Salmo salar)* are anadromous fish that depend on gravel and cobble river habitats for spawning and juvenile rearing. Juveniles use interstitial shelters for protection from predators, flow, and thermal stress. We quantified shelter availability in thirteen sites along Maine’s Narraguagus River using transects and hoop sampling. Parr averaged 4 shelters per m_ and young-of-year averaged 12.8. Ongoing analyses examine habitat factors like substrate size, embeddedness, velocity, and differences between tributary and mainstem sites.

Maine Sea Grant

Decary 207 | 1:25-1:45 p.m.

How Seaweed Harvesters' Livelihoods and Conservation Practices Are Impacted by Gentrification and Privatization in Maine's Coastal Zone

Johanna Birchem '26 | *Sarah Ebel, Ph.D.*

This presentation investigates the impacts of gentrification on policy formation and natural resource-based livelihoods in Maine's intertidal and coastal zone, with a focus on the human-environment relationships harvesters have with the seaweed ecosystems. We examine the questions: (1) How has gentrification resulted in policy and law changes in the intertidal zone? and (2) How are seaweed harvester livelihoods impacted by changes in resource access due to gentrification and privatization in the intertidal zone in Maine?

St. Francis College Class of 1969, SURE, and National Science Foundation EPSCOR Maine-SMART

Decary 207 | 1:50-2:10 p.m.

Analyzing Zooplankton Community Structure in a Marginal Ice Zone of the Weddell Sea.

Hailey Thomas M.S. '27 | *Patricia Thibodeau, Ph.D.*

The Weddell Sea, Antarctica is characterized by its extensive seasonal sea ice coverage, but sea ice is becoming increasingly variable with climate change. To understand how sea ice impacts zooplankton, which represent the primary food source for larger trophic organisms in Antarctica, net tows were performed from January to February 2026 from regions of sea ice to open water. Zooplankton abundance and community composition was highly variable reflecting the dynamic processes at play in summer.

National Science Foundation

Decary 207 | 2:15-2:35 p.m.

Marine Mammal Strandings in a Rapidly Warming Coastal Ecosystem

Emma Christopher M.S. '26 | *Will Kochtitzky, Ph.D., Patricia Thibodeau, Ph.D., Jeremy J. Kiszka, Ph.D., Michelle Caputo, Ph.D.*

Marine heatwaves (MHWs) are prolonged periods of anomalously warm ocean temperatures that are increasing in frequency, intensity, and duration. MHWs alter distributions, prey availability, and disease risk. This study examines links between MHWs and marine mammal stranding in the Gulf of Maine from 1990-2025 using NOAA stranding and sea surface temperature data. Results show latitudinal shifts in strandings, with models revealing nonlinear relationships between strandings and environmental variables, highlighting strandings as indicators of ecosystem change.

Maine Space Grant Consortium

Decary 207 | 2:15-3:00 p.m.

Ecology of Endurance: Identity and Power in Natural Systems

Lucy Stevens '26 | *Carrie Byron, Ph.D.*

Using marine ecological zones as a framework, this paper explores how environmental systems shape identity and power. Survival strategies across ocean zones help demonstrate that organisms endure through adaptation and relational dependence rather than autonomy. These ecological patterns suggest that identity emerges through negotiation with surrounding systems, offering a relational model for identity and power within both natural and social environments.

Decary 207 | 3:05-3:25 p.m.

From Mountains to Sea: Young Voices for Water

Sarah Bedore ’26, Chloe Boulle ’27 | *Matthew Siegel, MFA*

CMM 120 Visual Storytelling and the Natural World

This short film follows three MESA students and their teacher during a watershed field study. Through place-based learning, the students connect scientific concepts to lived experience, reflecting on environmental responsibility and community interdependence. Using water as a visual metaphor, the film explores growth, mentorship, and curiosity, illustrating how outdoor education fosters awareness and empowers students to become engaged, environmentally conscious citizens.

Decary 208 | 1:00-1:20 p.m.

A New Home for the Greeks

Elias George Nawfel | *Michael Cripps, Ph.D., Cathrine Frank, Ph.D.*

LIL 420 Arts and Humanities Capstone

This is a slideshow presentation of a podcast about how Greeks (my grandparents) built community in Lynn, Mass. and how they felt about traveling back to Greece after establishing an American identity. This presentation explores my family history along with my grandparents' view on their Greek heritage and how it blends with their American identity. This presentation explores immigration and building a new path as immigrants.

Decary 208 | 1:25-1:45 p.m.

Internship with the Maine Tree Foundation

Sarah Bedore ’26 | *Michael Cripps, Ph.D*

CMM 430 Internship in Communication

This Public Relations and Development Internship focused on supporting outreach, education, and community engagement within the forest ecology network. Through creating multimedia content, assisting in strategic communications, and collaborating

on research-based learning initiatives, this role strengthened my skills in storytelling, design, and professional communication. The experience allowed me to connect science with the public, foster environmental awareness, and contribute to accessible, community-centered educational resources.

Decary 208 | 1:50-2:10 p.m.

Reporting for Real: Lessons from an Internship with Sanford-Springvale News

Angelina Keizer | *Michael Cripps, Ph.D.*

CMM 430 Internship in Communication

An internship is an important hands-on learning experience that can have significant real-world consequences. In Spring 2026, I interned with Sanford-Springvale News, a hyperlocal paper in York County, Maine, built on the ashes of a failed local paper. Working with the editor and news team, I extended my course work in journalism to reporting for the local Sanford-Springvale community. In this presentation, I describe key triumphs and challenges, as I reflect on how I have become a more capable reporter as I look ahead to a career in journalism.

Decary 208 | 2:15-2:35 p.m.

Internship with the Biddeford Mills Museum

Chloe Boulle ’27 | *Michael Cripps, Ph.D.*

CMM 430 Internship in Communication

This semester I have worked as a museum PR intern for the Biddeford Mills Museum, an organization in Biddeford preserving its community’s industrial, economic, and urban history. In this talk I will outline my work as an intern building a digital platform for the museum, creating relationships with community partners, establishing a recognizable organization brand, and promoting museum events to the surrounding communities.

Decary 208 | 2:40-3:00 p.m.

The Effect of Direct and Indirect Cues of Predation on Crickets' Latency to Emerge From Hiding and Interact with Forage

Eliza Brooks '26, Timothy Cantwell '26, Grace Hutjens '26 | *Zach Olson, Ph.D.*

ANB 425 Advanced Methods in Animal Behavior

We will be presenting the results of an experiment testing the effect of direct and indirect cues of predation on crickets' latency to emerge from hiding and interact with forage. This study used direct (excrement) and indirect (presence of coverage) cues of predation to determine how house crickets' *(Acheta domesticus)* latency to emerge from refuge and approach forage is impacted by the two types of cues.

Decary 212 | 1:00-1:20 p.m.

Effect of White Noise and Traffic Noise on Female Cricket Agency

Michaela Chapman '26, Mali Smith '26, Emilee Richards '26 | *Zach Olson, Ph.D.*

ANB 425 Advanced Methods in Animal Behavior

We will be presenting the results of an experiment testing how white noise and traffic noise affect the probability and latency of a female cricket in approaching a male cricket call sound. Movement and orientation relative to the call sound source will also be analyzed and presented upon.

Decary 212 | 1:25-1:45 p.m.

Cricket Interpretation of Predation Risk

Samantha Slonecker ’26, Elijah Hanley ’26, Kassidy Bradshaw ’26 | *Zach Olson, Ph.D.*

ANB 425 Advanced Methods in Animal Behavior

The goal of the study is to investigate differences in cricket behavior when placed in a novel environment with differing predation risk. Predation risk conditions will be accomplished through the addition of auditory stimuli from either a species-relevant predator, a non-predator, or an abiotic source. Fear behaviors will be measured through use of an ethogram.

Decary 212 | 1:50-2:10 p.m.

Behavioral Responses of House Crickets *(Acheta domesticus)* to Echolocation Calls from Predatory and Non-Predatory Bats

Ryleigh Doser ’26, Aidan DiBona ’26, Hadli Nate ’26 | *Zach Olson, Ph.D.*

ANB 425 Advanced Methods of Animal Behavior

We will be presenting the results of an experiment testing whether house crickets *(Acheta domesticus)* can distinguish between bat species based on echolocation calls. We hypothesized that crickets would differentiate among bat species and show stronger antipredator responses to predatory bats. Crickets were exposed to audio recordings from four bat species: the pallid bat *(Antrozous pallidus)*, big brown bat *(Eptesicus fuscus)*, little brown bat *(Myotis lucifugus)*, and the non-predatory vampire bat *(Desmodus rotundus)*. Behavioral responses were measured to evaluate predator recognition and antipredator decision-making.

Decary 212 | 2:15-2:35 p.m.

DIRECTORY

POSTERS BY AUTHOR

**FD = Featured Display*

RESEARCH TALK SCHEDULE

	Decary 203	Decary 205	Decary 207	Decary 208	Decary 212
1:00 p.m.	Eon	Marvin, Libby, and McNally	Crowley	Bedore and Boulle	Brooks, Cantwell and Hutjens
1:25 p.m.	Doane	Araneo, Peterson, and Bartolome	Fox	Nawfel	Chapman, Smith and Richards
1:50 p.m.	Furtado	Wise, Faulkner, and Van Steele	Birchem	Bedore	Slonecker, Hanley and Bradshaw
2:15 p.m.	Lunt	Burns, Sidman, and Kimball	Thomas	Keizer	Doser, DiBona and Nate
2:40 p.m.	Carrona	Goble, Jerome, and Morris	Christopher	Boulle	
3:05 p.m.	Pomerleau		Stevens		

THANK YOU

THANK YOU!

The 26th 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 robust and diverse array 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, Facilities Management, Parkhurst, the Office of Communications, and the Office of Admissions and Marketing 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 Institutes of Health (NIH), the Kahn Family Foundation, the National Science Foundation and the Maine EPSCoR Grant, UNE's Office of Research and Innovation, the Maine Outdoor Heritage Fund, Maine Space Grant Consortium, St. Francis College Class of 1969, the David E. Shaw Innovation Fellowship, Maine Coastal and Marine Climate Fund, Scarborough Land Trust, North2North, the

Hudson Valley Farm Hub, the UNE-GMRI Accelerator Grant, the IDeA Network of Biomedical Research Excellence (INBRE), and the 2025 Doug and Lauren Sanford Marine and Environmental Science Fellowship Fund.

Finally, a warm thank you to Bekah Robertson 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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INNOVATION FOR A HEALTHIER PLANET