University of New England
College of Arts and Sciences

23RD ANNUAL SPRING RESEARCH SYMPOSIUM

UNIVERSITY OF NEW ENGLAND

INNOVATION FOR A HEALTHIER PLANET

Friday • May 5, 2023

CONTENTS

RESEARCH AT UNE

On behalf of the UNE College of Arts and Sciences (CAS) Dean's Office, welcome to the 2022-23 CAS Spring Research Symposium! This event, now in its 23rd year, showcases the scholarly and creative endeavors of our students through posters and oral discussions and represents the outcomes of over 130 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 more 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 5, 2023 | 9:30 a.m.–4 p.m.

9:30–11:30 a.m. | Poster Presentations | *Campus Center Gym*

11:30 a.m.–12:30 p.m. | Lunch and Speakers | *Campus Center Gym*

James Herbert, Ph.D.
President, University of New England

Brandon Hotham, B.A. '12 (Psychology and English), M.P.H. '14
Keynote Speaker

1–4 p.m. | Oral Presentations | *Decary Hall, Second Floor*

KEYNOTE SPEAKER

Brandon Hotham, B.A. ’12, M.P.H. ’14

Brandon Hotham is the Chief Experience Officer at the Dempsey Center in Lewiston and South Portland, Maine, where he is responsible for client strategy and operations, supporting any individual navigating cancer with evidence-based support care services. Following his Bachelor of Arts in 2012, Hotham earned his Master of Public Health degree from UNE in 2014. He has worked for several health care-related organizations in Maine and beyond, including the Maine Health Management Coalition, Martin’s Point Health Care, Grand Rounds/Included Health, and Central Maine Healthcare. He has been with the Dempsey Center since April 2022. Hotham has also been a member of the Board of Directors of the Oasis Free Clinic (Brunswick) and a Voting Committee Member for the Coordinating Committee of the National Quality Forum (Washington, DC).

While a student at UNE, Hotham engaged in undergraduate research throughout his education and across disciplines. He was a two-time SURE student, first with Linda Morrison, Ph.D. and Susan McHugh, Ph.D. (producing a documentary film on queer assimilation vs. radicalization in Maine) and then with Cathrine Frank, Ph.D. (producing a literature review focused on privacy law in a growing social media and technology driven environment). As an undergraduate and then a master’s student, he collaborated with Maryann Corsello, Ph.D. (Emeritus Professor) through the REACH project to better evaluate and understand local youth prevention efforts in Maine. Hotham was a Resident Advisor for two years, the Editor-in-Chief of the Nor’easter News, an Orientation Leader, actively involved with the Undergraduate Student Government and the UNE Players, and was a UNE Student Trustee in 2011-12.

POSTER PRESENTATIONS

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.*

1. Coral Fluorescence

Katelyn DeWater ’26, Caitlin Cournoyer ’24,
Clayton Nyiri ’25, Ben Wheeler ’24, Rachel Becker ’24,
Josephine Pikowski ’26, Megan Pike ’24, Nicole Doucette ’26 |
Jeri Fox, Ph.D., Michael Esty

The goal of this project is to develop a camera that can capture the fluorescent wavelengths of corals as well as to create a 3D model of a coral reef in Belize. Corals contain fluorescent pigments that protect themselves and their *Symbiodinium* from UV radiation. Coral fluorescent wavelengths can be measured to determine their health and a 3D model can be used to map coral locations on reefs.

2. Calculating Tidal Volumes at Goose Rocks Beach, ME, Using a Graphical Modeler in QGIS

Katelyn DeWater ’26 / John Kraeuter, Ph.D. |
Will Kochtitzky, Ph.D.
GIS 162 Application of Geospatial Science and Technology

In the past, *E. coli* concentration levels have exceeded the EPA’s recommended limit of safe swimming concentrations at Goose Rocks Beach (GRB), Maine. One tributary at the north end and two tributaries at the south end of GRB are of interest because they drain salt marsh water that may contain high levels of *E. coli* directly into GRB. This modeler will be used to understand *E. coli* levels as they relate to calculated tidal volumes.

3. Enterococci Bacteria Levels at Goose Rocks Beach

Jack Genoways ’25, Katelyn DeWater ’25 | *Will Kochtitzky, Ph.D.*

GIS 162 Application of Geospatial Science and Technology

In Fall 2022 and Spring 2023, I assisted Dr. John N. Kraeuter, a research professor at the University of New England (UNE) and member of the Shellfish Conservation Committee for Kennebunkport, Maine, in quantifying the persistently elevated levels of Enterococci bacteria in the rivers and marshes, at median low water (MLW) and median high water (MHW) behind Goose Rocks Beach.

4. Comparison of the Implied Diameter of Duplex, Triplex, and Quadruplex DNA Imaged by Atomic Force Microscopy in Air

Hannah D’Amaddio ’24, Faye Botelho ’24, Ben Wheeler ’24, Peter Swanson ’24 | *James Vesenka, Ph.D.; Eva Rose Balog, Ph.D.*

Atomic Force Microscopy (AFM) is a high-resolution imaging technique, combining the capability of visualizing a wide range of materials from micro- to nanometer range with forces from pico- to nanonewtons range. The current report aims to provide a comparison of duplex, triplex and quadruplex DNA structures on treated mica surfaces imaged in ambient air conditions using tapping mode AFM. The resulting images give an insight into how air imaging and the AFM probe affect the topology.

5. Effect of Poly(vinyl acetate) Architecture on Solvation in Supercritical CO_2 via Molecular Simulations

Peter Swanson '24 | *John Stubbs, Ph.D.*

Supercritical CO_2 is a green and cost-effective solvent used in many applications. However, its efficiency and range of applicability can be improved by the addition of a cosolvent. We present molecular dynamics simulations examining the behavior of poly(vinyl acetate) (PvAc) as a cosolvent in supercritical CO_2, comparing the physical and structural properties of linear and three-armed PvAc polymers and their impact on the subsequent solvation environment. Results from this study provide insights into their applicability.

6. Microplastic Contamination and Tissue Distribution in Atlantic Sea Scallops

Sarah Swanick '23; Amber-Rae Pesek '26; Lyle Massoia '22, '24 | *Kristin Burkholder, Ph.D.; Carrie Byron, Ph.D.*

Ocean microplastics may pose a risk to seafood safety. Microplastics are ingested by marine organisms such as sea scallops, but it is unclear whether microplastics remain in the scallop digestive tract, which is not often consumed by humans, or translocate to edible tissues such as the adductor muscle. Here, we extracted and quantified microplastics from the gut and adductor muscle of Atlantic sea scallops to compare microplastic levels in edible versus non-edible scallop tissue.

7. Comparison of Bacterial Binding to Different Types of Microplastics

Justin Trueira ’23, Carly Stringer ’23, Lyle Massoia ’22 ’24 | *Kristin Burkholder, Ph.D.*

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

8. Saving UNE’s Shoreline: Effective Strategies for Communicating About the Living Shoreline Project

Danielle Giacalone ’24, Alec Worthen-Sluz ’24, Samuel Walsh ’24, Jessica Gross ’25, Kaleb Burns ’24, Virginia May ’24, Brooke Parks ’23, Jackson Schuyler ’24, Alex Woodworth ’24, Abby Conway ’23 | *Pam Morgan, Ph.D.*

ENV 262 Gulf of Maine Field Studies

We researched the most effective way to communicate with UNE undergraduate students and administrators about the Living Shoreline Project on the Biddeford campus. This project will help to protect our campus shoreline from erosion. We conducted a survey and focus group, and discovered that communication strategies would need to be tailored to each stakeholder group. Our results led to the creation of several communication tools which we are implementing this semester.

9. Five Scientific Breakthroughs at UNE Towards American Chestnut Restoration

Virginia May ’24, Kayla King ’23, Lydia Sawyer ’26 |
Thomas Klak, Ph.D.

The UNE American chestnut restoration project continues to spearhead chestnut research through five breakthroughs the past year. (1) We have produced unprecedented quantities of genetically engineered Darling58 pollen which is (2) genetically and geographically diverse. (3) Our breeding has resulted in fifth generation seedlings which are the most genetically diverse yet. (4) We are the only U.S. lab to produce fully developed fertile chestnuts indoors and (5) produce homozygous D58 chestnuts and embryos.

Jim Searing (donor)

10. Evaluating a Microprocessor Based Bycatch Reduction Device (MB-BRD) on *Squalus Acanthias* (Spiny Dogfish) in Lab and Field Settings

Clayton Nyiri ’25 / Sara Mirabilio, M.S., Richard Brill, Ph.D., Peter Bushnell, Ph.D., Walter Golet, Ph.D., Ilan Levine, Ph.D. |
John Mohan, Ph.D.

Bycatch is when nontarget organisms such as *Squalus acanthias* (Spiny Dogfish) are caught in recreational and commercial fisheries, causing profit reduction, gear damage, and fishing mortality leading to potential population declines. Microprocessor Based Bycatch Reduction Devices (MB-BRDs) are custom-built devices that emit electrical stimuli into the water to disturb elasmobranch’s electroreceptors. This project reviews the laboratory and field data gathered on MB-BRDs effectiveness as a deterrent for *S. acanthias*.

NOAA Saltonstall-Kennedy Program

11. Can *Staphylococci* Become Resistant to the Antibiotic Adjuvant Pyrogallol?

Dongjae Kang ’25, Yesul Kang ’22 | *Kristin Burkholder, Ph.D.*

Staphylococcus epidermidis and *Staphylococcus aureus* are common bacterial pathogens that can cause invasive, and potentially drug-resistant, infections. Our lab previously found that the phenolic compound, pyrogallol, acts as an antibiotic adjuvant by increasing *staphylococcal* susceptibility to certain antibiotics. In this project, we will assess whether *staphylococci* can develop resistance to the effects of pyrogallol. This work will help elucidate the potential value of pyrogallol as an anti-*staphylococcal* antimicrobial adjuvant.

12. Optimization of Electrochemical Method for Determination of Acetaminophen

Tehreem Pasha ’25 | *Jerome Mullin, Ph.D.*

The goals of this project were to adapt and optimize an electrochemical method for the determination of acetaminophen for use in undergraduate laboratories, using screen-printed carbon electrodes and Microlab data acquisition instruments. Following successful proof-of-concept, experimental parameters were optimized, and the method was used to determine acetaminophen in commercially available OTC headache preparations. No significant difference between the experimentally determined amount of acetaminophen per tablet and product label specification was demonstrated at the 95% confidence level.

13. Pyrogallol Alters Bacterial Susceptibility to Antibiotics That Target the Ribosome

Anjanadevi Govindaraj ’25, Alya Theriault ’24 | *Kristin Burkholder, Ph.D.*

Antibiotic resistance is a worldwide public health problem and novel approaches are needed to treat bacterial infections. Our lab has found that the phenolic compound, pyrogallol, can increase bacterial susceptibility to linezolid, which is an antibiotic that kills bacteria by inhibiting ribosome function. In this study, we expand on that work to examine whether pyrogallol similarly enhances the antibacterial activity of additional antibiotics that target the bacterial ribosome.

14. Pyrogallol-hydrocarbon Hybrid Compounds Increase Antibiotic Efficacy Against *Staphylococci*

Alya Theriault ’24, Anjanadevi Govindaraj ’24, Carolyn Curley ’23, Sarah Padellaro ’23 | *Kristin Burkholder, Ph.D.; Amy Deveau, Ph.D.*

Staphylococcus aureus and *Staphylococcus epidermidis* are common bacterial pathogens that can cause serious infections. Given rising rates of *staphylococcal* drug resistance, new treatment approaches are needed. We previously found that the phenolic compound, pyrogallol, increases *staphylococcal* susceptibility to antibiotics. Here, we expand on that work by testing the effect of chemically modified versions of pyrogallol on antibiotic efficacy. We report that addition of hydrocarbon side chains to pyrogallol increases its affect on antibiotic efficacy against *staphylococci*.

15. Structural Characterization and Toxicology Analysis of Polyphenolic Derivative with Antimicrobial Properties

Sarah Padellaro ’23 | *Amy Deveau, Ph.D.*

Antimicrobial resistance is a serious challenge for modern medicine. New compounds with structural diversity and novel mechanisms are urgently needed to combat the global threat to human health. Prior investigation supports a hybrid compound featuring a polyphenol core, ketone linker, and hydrocarbon chain that exhibits significant antimicrobial activity. This research highlights the compound characterization and preliminary toxicology data of a hybrid compound, analyzing the morphological and cardiovascular effects in *Danio rerio* (Zebrafish) upon compound exposure.

16. Great White Shark Resurgence in New England

Cole Currie ’23 | *Susan Farady, J.D.*

MAF 400 Marine Affairs Capstone

This presentation is about the number of great white sharks that have returned to the New England waters. It goes into the research of white sharks and how to keep track of the sharks' movements.

17. Sea Level Rise and Poverty in the Philippines

Elias Young ’23 | *Susan Farady, J.D.*

MAF 400 Marine Affairs Capstone

In 2023, human society faces continuous sources of existential problems that have stemmed from anthropogenic climate change. One of the effects associated with anthropogenic climate change is sea level rise, which refers to the gradual increase in sea level over the past hundred years and onward. My project looks the projected sea level rise of the waters near the Philippines, how impoverished Filipinos will be put into danger, and what can aid the country.

18. Effect of Arctic Continental Shelf Land Claims on Arctic Diplomatic Relations

Isabella Petroni ’23 | *Susan Farady, J.D.*

MAF 400 Marine Affairs Capstone

There are multiple political, economic, and social benefits for Arctic nations making successful claims in the Arctic Outer Continental Shelf. Achieving diplomacy in this region is extremely difficult, even among countries considered allies, under other circumstances. This project will show how land claims of the Arctic Continental Shelf affect diplomatic relations and decisions between Arctic nations. It will also show how these diplomatic relations can be improved in the future to strengthen ties.

19. The Effect of Anthropogenic Disturbance Level on Soil Respiration in Vernal Pools

Juliana Z Horne ’23 | *Pam Morgan, Ph.D.*

Vernal pools are a classification of wetland. They’re distinguished from other wetlands by a lack of inlet or outlet and so fill via rainwater and snow melt until the summer’s end when they dry up. They play a significant role in the carbon cycle, but there’s little known on how anthropogenic disturbances impact this role. This study seeks to understand whether proximity to disturbance results in a significant change in soil respiration of carbon dioxide.

20. Limitations of Using the COI1 Gene for Creating Phylogenetic Trees of Species

Kenzi Kimball ’24 | *Markus Frederich, Ph.D.*

DNA barcoding allows for the comparison of multiple sequences to find evolutionary relationships between organisms using phylogenetic trees. To illustrate these relationships, organisms were sampled from Biddeford Pool, DNA was isolated, then the COI1 gene was amplified and sequenced. The preliminary findings highlight the presence of both clear and unclear evolutionary relationships. Therefore, a more comprehensive genetic database per species is required.

21. Do Elemental Patterns in White Hake Otoliths Record Historical Temperatures in the Gulf of Maine?

Benjamin Gowell ’25; Benjamin LaFreniere ’22, ’23 / Rebecca Peters, Briony Donahue, Nathan Miller, Alicia Cruz-Uribe | *John Mohan, Ph.D.*

White hake *(Urophycis tenuis)* are a key ecological demersal gadid species found within inshore and offshore habitats in the Gulf of Maine (GoM). White hake use calcified earstones known as otoliths, for hearing and balance. Otoliths should reflect water chemistry throughout life as elements are permanently incorporated into the crystal structure through fish growth. This study examines if otolith core trace element concentrations are changing over time as records of increasing temperatures in the GoM.

22. Biomineral Biographies: Elucidating Elemental Patterns in the Natural Tags of Atlantic Bluefin Tuna and White Sharks

Leo Edmondson ’24 / Alicia Cruz-Uribe, Michelle Passerotti | *John Mohan, Ph.D.*

Atlantic bluefin tuna *(Thunnus thynnus)* and white sharks *(Carcharodon carcharias)* are highly migratory, endothermic predators. The novel technique of elemental mapping was used to analyze their otoliths and vertebrae, respectively. Due to bluefin tuna and white sharks’ shared physiological traits, this study focused on investigating and comparing elemental patterns between hard parts. This is a preliminary foray into analysis with an emphasis on establishing methodology for this cutting-edge technique.

UNE mini-grant

23. Investigating Migratory Paths of Bobolinks *(Dolichonyx oryzivorus)* from Maine, Pennsylvania, and Vermont

Holly Stone '24 | *Noah Perlut, Ph.D.*

This project investigated if there is a common pattern taken for migration routes, how long does migration take, how do movements vary with different states, are there communal areas, and if migration is affected by sex (either time or route). This was investigated using Motus tracking devices, which allowed migratory pathing of the bobolinks to be recorded. Upon observation, the pathing seemed to be the same for almost all bobolinks that were tracked.

24. Protein Expression of Cellular Stress Markers in *Homarus Americanus*, Stages I-V

Claire Fecteau-Volk '26; Aubrey Jane '20, '23 / Eric Annis, Ph.D. | *Markus Frederich, Ph.D.*

The heat tolerance of post-larval lobsters remains understudied, but is important to understand settlement and spatial shifts in populations as the climate changes. Using Western Blots we characterized protein expression of HSP70 and AMPK in stages I-V lobsters and characterized stage-specific thermal responses.

University of New England, National Science Foundation

25. The Fall of the Lobstering Industry in Maine Due to Climate Change

Jillian Currier ’23 | *Susan Farady, J.D.*

MAF 400 Marine Affairs Capstone

My presentation discusses the effects of climate change and how that will lead to lobsters moving further offshore and North. I go over the physical effects warming water temperature and ocean acidification have on lobsters and how it leads to shell disease and larval stage disruption. I explain the importance of lobstering in Maine historically, culturally, and economically. I finish by stating next steps such as education and job alternatives.

26. Visualizing the Retreat of the Vatnajökull Ice Cap in Iceland

Patrick Spezzano ’23 | *Will Kochtitzky, Ph.D.*

GIS 162 Application of Geospatial Science and Technology

Since the early 1900s glaciers have been retreating faster than normal due to anthropogenic carbon emissions. Recently, Iceland has experienced the melting of entire glaciers, the Vatnajökull Ice Cap is composed of nearly 30 outlet glaciers and currently covers ~8% of Iceland. The aim of this project will be to assess the retreat of south-facing and north-facing glaciers between 1960 and 2020. It is expected that recent years have seen greater retreat than previous decades.

27. Tree Line Change at Mount Washington

Jasmyne Bickford ’24 | *Will Kochtitzky, Ph.D.*

GIS 162 Application of Geospatial Science and Technology

My poster shows tree line changes from the oldest data I can find to the most recent data I can find. This will show the effects of climate change as the upper parts of the mountain get warmer, it provides trees with what they need in order to grow.

28. Are Trees Able to Live at Higher Elevations Due to Climate Change?

Jake Tobin ’25 | *Will Kochtitzky, Ph.D.*

GIS 162 Application of Geospatial Science and Technology

Using a DEM and aerial photos, I am looking at how the tree line on the top of Mount Washington has changed over the last 50 years.

29. Investigating the Degradation of MS2-Containing mRNAs via Autophagy

Brett “Dez” Schrankel ’24 | *Jennifer Garcia, Ph.D.*

Our work has focused on a mechanism, called autophagic RNA decay, and its role in surviving stress. To understand whether RNA fragments undergo autophagy, we used microscopy to test if RNA decay fragments associate with specific cell structures. Our findings from this study will provide support for a novel pathway that can remove undegradable RNA, a potentially damaging waste material, and may provide insight into the possible treatment of neurodegenerative disorders like ALS.

Boettcher Foundation

30. Examining the Effects of Rny1 on Gene Expression During Glucose Rich Growth in Yeast

Maxi Bird '23 | *Jennifer Garcia, Ph.D*

In humans, mutations within the RNase T2 gene are linked to a rare neurodevelopmental disorder. To better understand this disease, we look at the role of Rny1, a RNase T2 enzyme, in regulating gene expression to promote proper growth in yeast. Using RT-qPCR, we investigated levels of specific mRNAs during glucose-rich growth. Uncovering the means by which Rny1 regulates gene expression helps us gain an understanding of how RNase T2 can contribute proper neurological development.

31. Trace Element Analysis of Shortfin Mako *(Isurus Oxyrinchus)* Vertebrae to Differentiate Between Global Populations

Peter Hennessy '25; Abigail Hayne '19, '23 | *John Mohan, Ph.D.*

The Shortfin Mako *(Isurus oxyrinchus)* is a highly migratory elasmobranch occupying much of the world's oceans and is important in commercial and recreational fisheries. To better understand their life history, this study used trace element analysis of vertebral cartilage in shortfin makos to investigate if individuals from different regions have distinct elemental signatures in the vertebrae edge. Elemental patterns will be compared to satellite tagging and genetic studies to better understand population connectivity of Makos.

Save Our Seas Foundation

32. Exploring the Life History of the Round Stingray Through Trace Element Analysis

Richard Szumita ’23 / Bethany Brodbeck ’22, Kady Lyons, Ph.D., Nathan Miller, Ph.D. | *John Mohan, Ph.D.*

Understanding marine species’ habitat usage and geographic distribution are paramount to both management and conservation. The Round Stingray is a marine elasmobranch that is known to segregate by sex. Analysis of trace element concentrations in the vertebrae of multiple individuals of a population may reveal unknown lifestyles, as elasmobranch vertebrae grow layers throughout life. Comparisons of vertebral trace elements between males and females offers insight into the sex-specific life histories of Round Stingrays.

Georgia Aquarium

33. How Quickly Do *Pseudopleuronectes Americanus* Become What They Eat? Utilizing A Controlled Diet Switch to Explore Stable Isotope Turnover of Winter Flounder

Audrey Fox ’26, Addie Binstock ’23 | *John Mohan, Ph.D.*

Winter Flounder *(Pseudopleuronectes americanus)* are found in abundance in the Saco River estuary. In order to improve the effectiveness of field stable isotope studies, a controlled laboratory diet switch was conducted. Flounder were fed a stabilizing diet of Atlantic Silverside *(Menidia menidia)*, then switched to Mysis *(Mysida sp.)* or Krill *(Euphausiacea sp.)*. The effect of growth and metabolism on tissue turnover rates were explored in muscle, liver, skin and digestive tissue.

34. Exploring Stable Isotope Analysis of Atlantic Bluefin Tuna, *Thunnus Ehynnus*, Eye Lenses

Emma Christopher '25 | *John Mohan, Ph.D.*

The eye lenses of fishes, such as red snapper, are known to be recorders of age, growth, and life history, as they grow chronologically in protein layers, like otoliths. The eye lens of Atlantic Bluefin Tuna, *Thunnus thynnus*, have not been studied for such properties or compared to otoliths. The goal of this study is to establish a methodology for studying stable isotope analysis of *T. thynnus* eye lenses and compare results to bluefin otoliths.

35. Exploring Spiny Dogfish *(Squalus acanthias)* Life History Using Genetic and Stable Isotope Analysis

Ruhika Bhattacharya '24 | *John Mohan, Ph.D.; Steven Travis, Ph.D.*

The increase in overfishing and bycatch in global fisheries calls for a deeper understanding of elasmobranch life history. Studying population genetics as well as stable isotopes can be used to explore this as they are useful indicators of reproduction and trophic relationships in individuals. Using opportunistic spiny dogfish *(Squalus acanthias)* pups, this study currently aims to explore the relationship between distinct stable isotope concentrations in different tissue samples (muscle, liver, and yolk) and gestation periods.

36. Determining Environmental Conditions Along Bobolink Migration Routes

Kathryn McGee ’24 | *Will Kochtitzky, Ph.D., Noah Perlut, Ph.D.*

ENV 524 Remote Sensing

Bobolinks are long-distance migratory birds that travel 12,500 miles between North and South America each year. Utilizing migration data collected using light-level geolocators we can calculate the location of birds, but not the weather they experienced while migrating. GIS analysis using ERA-5 climate reanalysis data determined the temperature and precipitation conditions experienced by migrating birds along their migration route. This project will contribute to my thesis studying how environmental and genetic cues influence migration behavior.

37. Svalbard and GIS

Christopher Weis ’24 | *Will Kochtitzky, Ph.D.*

GIS 162 Application of Geospatial Science and Technology

GIS 224 Remote Sensing

This research project will be looking at the change in glacier melt and change in salinity in and around Svalbard. The methods will be using GIS knowledge to better map and understand what is happening and if there is any correlation. This project will also showcase what we can gather and use with GIS to better understand our oceans and world around us.

38. Glacial Lake Mapping in Novaya Zemlya, Russia, and Integrity in Science

Kaleigh Potter ’25 | *Will Kochtitzky, Ph.D.*

GIS 162 Application of Geospatial Science and Technology

In October of 2020, Dan Shugar et al. published the first attempt to globally map glacial lakes and their evolution over time in *Nature Geoscience*. Their automated mapping methods resulted in inconsistent, misshapen, and misplaced lake outlines, causing misleading results about the growth in glacial lakes globally. I am using GIS to re-map the glacial lakes in Novaya Zemlya, an archipelago in northern Russia, and correct the dataset.

39. Spotting Salamanders: Identifying Vernal Pool Locations From Lidar and Aerial Imagery

Caroline Fales ’25, Matthew Pittsley ’25 | *Will Kochtitzky, Ph.D.*

GIS 162 Application of Geospatial Science and Technology

Through the use of lidar raster data and aerial imagery, this project seeks to design maps of potential and known vernal pool locations in the 363 parcel and on the UNE Biddeford campus. This project uses novel methods to classify these ephemeral wetlands through the use of remote sensing techniques and GIS as well as produce maps of known vernal pools, their elevations, sizes, and endangered species importance.

40. Addressing the Effectiveness of Empirical Bayesian Kriging on Predicting Glacier Thickness

Ryan Reed ’23, Becky Powers ’23 | *Will Kochtitzky, Ph.D.*

GIS 162 Application of Geospatial Science and Technology

We will be using the Empirical Bayesian Kriging tool to estimate and fill in ice thickness data gaps of Canadian glaciers and to measure the uncertainty in interpolation to address the effectiveness of Empirical Bayesian Kriging as a tool for predicting ice thickness. Therefore, we will use interpolation to answer questions about which glaciers may be melting the fastest and predict which glaciers and specific areas of glaciers are most vulnerable to glacial melting.

41. Changes in a Tidal Salt Marsh in Biddeford, Maine

Michael Fish ’23, Katelyn DeWater ’26 | *Will Kochtitzky, Ph.D.*

ENV 410 Environmental Research

Determine how the salt marsh has changed in the last 60 years using aerial imagery, drones, and elevation data.

42. Using GIS and Drones to Advance American Chestnut Restoration

Abigail O’Hern ’24 | *Will Kochtitzky, Ph.D.*

GIS 162 Application of Geospatial Science and Technology

UNE hosts more than 600 transgenic chestnut saplings in an orchard in Cape Elizabeth. The transgenic chestnuts are compared against control trees, to see if they out perform the unmodified trees. Using UNE’s drone and Agisoft software, we are able to measure the trees with GIS technology. We deployed the drone to collect, process, and conceptualize data to automate measurements that would normally be taken by hand.

43. Measuring Deforestation in the Amazon Using Landsat

Paige-Marie Merrill ’24 | *Will Kochtitzky, Ph.D.*

GIS 224 Remote Sensing

The Amazon is the largest tropical rainforest in the world and accounts for over 10% of Earth’s biodiversity. Large-scale deforestation in the 1900s has begun to deteriorate these crucial ecosystems, leading to biodiversity loss and species extinction, increased risk of zoonotic diseases, climate change, and more. I used satellite imagery from Landsat 1-9 to observe and quantify these changes and found evidence of significant deforestation in the Brazilian Amazon.

44. Locales Only

Luke Gould ’23 | *Will Kochtitzky, Ph.D.*

GIS 224 Remote Sensing

Surfing over the course of the last few years has experienced a drastic increase in popularity due to the pandemic. As people sought to escape the confines of their homes, more and more of them appeared in the lineups at your local surf break. The model displays new, uncrowded spots that are likely to have surfable waves. This was done using bathymetric data paired with coastline orientation data and a simulated swell direction.

45. Wolves and Wildfires: The Effects on Vegetation at Yellowstone National Park

Marley Cloutier ’23, Courtney McColgan ’23 |
Will Kochtitzky, Ph.D.

GIS 162 Application of Geospatial Science and Technology

Research about the environmental recovery of Yellowstone National Park suggests that vegetation in grasslands are recovering. Vegetation declined due to both wildfires and the overpopulation of grazing animals like elk. We are examining the lingering effects of wildfires from 1988 and 2016 along with the reintroduction of wolves and how they’ve influenced vegetation growth over the years.

46. Shellfish Aquaculture Management in Washington State

Katie Bergin ’23 | *Susan Farady, J.D.*

MAF 315 US Aquaculture Management and Policy

Shellfish aquaculture is a huge economy in Washington state. Shellfish aquaculture is managed by the Department of Ecology of Washington. The only issue is the wastewater from aquaculture farms. Washington has many strict laws about wastewater and how to dispose of it. This allows the state to carefully watch the natural water quality. Through these laws, permits, and overview of shellfish aquaculture in Washington, a more sustainable, more environmentally conscious way to farm shellfish results.

47. Observational Care Practices of Seahorses *(Hippocampus erectus)*

Katie Bergin ’23, Morgan Segrest ’23, Nate Roy ’23 | *Michael Galloway*

Seahorses *(Hippocampus sp.)* are unique organisms that have different behaviors and living requirements from other organisms in their phylum, Chordata. In this study I created two optimal tank environments for *Hippocampus erectus*, considering water quality, hitching posts, and tank mates. I observed their natural behaviors around the different elements of their tanks (i.e., fake corals, live macroalgae, conspecifics). By observing these behaviors, I saw how these variables affected feeding activities, energy levels, and more.

48. Comparative Analysis of Policy and Management on Fish Farming in Maine and Oregon

Jared Franceschelli ’24 | *Susan Farady, J.D.*

MAF 315 US Aquaculture Management and Policy

My focus will be doing a comparative analysis between Maine and Oregon and the different approaches each state takes, and how certain benefits and disadvantages of policy and management for supporting and promoting fish farming practices in Maine and Oregon. One of my main goals is to see if these policy and management practices are the best and most effective ways of producing a more sustainable way of fish farming and looking at different avenues to see if there’s any other way that we could approach policy and management in various states and how will that be achieved.

49. What Does Mariculture Look Like in Alaska, What Is the Tribal Involvement, and How Is Climate Change Impacting It?

Julia Popson ’23 | *Susan Farady, J.D*

MAF 315 US Aquaculture Management and Policy

I want to look into the mariculture industry in Alaska and how that differs from traditional aquaculture. I have researched the differences but want to know why mariculture is a bigger industry than aquaculture and why tribal nations are more apt to support mariculture than aquaculture. I also want to look into how climate change is going to affect these projects and what we can expect from these projects in the future.

50. The Future of Management for Invasive Species and Escapees in United States Aquaculture

Brittney Bull ’24 | *Susan Farady, J.D.*

MAF 315 US Aquaculture Management and Policy

Invasive species and escapees often go hand-in-hand when it comes to the aquaculture industry and is used as a negative take whenever there’s talk about expansion. This project aims to provide insight and examples of how these two categories can be managed in the United States through research and other countries’ frameworks and regulations.

51. Exploring Variations in Band Deposition of Three Calcified Structures in Atlantic Spiny Dogfish *(Squalus Acanthias)*

Molly Smith '24 | *John Mohan, Ph.D.*

Age determination in elasmobranchs is achieved by the analysis of annually formed growth increments in calcified structures. Atlantic spiny dogfish *(Squalus acanthias)* have three structures which can be utilized, however discrepancies between them results in varying age estimates. This study compares the mantle and inner dentine layers of the dorsal spine and the vertebrae centra of Atlantic spiny dogfish *(Squalus acanthias)* for variation in band deposition.

52. How is Oyster Aquaculture Regulated and Managed in New York: Oyster Aquaculture Case Study

Antoine Mier '24 | *Susan Farady, J.D.*

MAF 315 US Aquaculture Management and Policy

The New York City Harbor was once home to over 220,000 acres of oyster reefs, but with a growing population that was hungry for oysters and pollution killing off the Harbor, the last commercial oyster bed was closed in 1927. This led to the creation of oyster farms in NY. This project will research how these oyster farms are managed, permitted, leased, and regulated under NY state and Federal laws.

53. A Comparison of Finfish Aquaculture Policy and Regulation in Maine and Washington

Courtney Carter ’23 | *Susan Farady, J.D.*

MAF 315 US Aquaculture Management and Policy

A comparative analysis looking into finfish aquaculture policy and management in Maine and Washington.

54. Opening the Closure Zones: Viability of Depurating Shellfish in Southern Maine

Michael Scannell ’24 | *Susan Farady, J.D.*

MAF 315 US Aquaculture Management and Policy

For my research topic, I’m interested in answering the question if depurating shellfish, specifically oysters, could be the answer to allowing lease sites to open up in closure zones, such as the sizable closure areas in Casco Bay and Saco Bay, and if it could be economically viable. Maine is an up and coming aquaculture powerhouse, but bacterial closures are the biggest hurdle for anyone wanting to farm in the Southern Maine region.

55. Farming the Oceans: A Case Study of Seaweed Aquaculture Policy and Regulation in the U.S.

Brian Will ’23 | *Susan Farady, J.D.*

MAF 315 US Aquaculture Management and Policy

Seaweed aquaculture is one of the fastest-growing aquaculture sectors in the United States presenting economic benefits and novel legal considerations. The work presented here describes and analyzes the current management and policy systems of seaweed aquaculture in the United States.

56. The Maine Owl Pellet Project

Heather Marvin ’26, Aliyah Walker-Pasko ’24 | *Zachary Olson, Ph.D*

The Maine Owl Pellet Project is a collaboration between the University of New England, the Maine Department of Inland Fisheries and Wildlife, and the United States Fish and Wildlife Service that aims to engage the public and promote crowdsourced science to better understand the diet of Maine’s owls and the distribution and composition of the small mammal community on which they prey, including the threatened northern bog lemming, to inform conservation efforts.

Maine Outdoor Heritage Fund

57. COVID-related Reminders and Desires for Intimacy

Mia Morgan ’23, Danielle McCarthy ’26, Anika Koopman ’24, Sophia Simeone ’23 | *Julie Longua Peterson, Ph.D.*

This project focuses on the effect of social distancing prime words on partner preferences, fears of being single, and desires for emotional and physical intimacy. We explored whether participants who were primed with social distancing words (vs. control words) would feel more socially disconnected, which would increase fear of being single, desires for intimacy, and approval of casual sex.

58. The Mediating Effects of Political Conservatism on Empathy for Vulnerable Populations and COVID-19 Protective Behaviors among Queer and Cishet College Students

Sophia Simeone ’23, Anika Koopman ’24, Mia Morgan ’23 |
Julie Longua Peterson, Ph.D.

This research used a correlational design across two studies. We collected data during the implementation of COVID-19 protective measures (study 1) and after those measures were lifted (study 2). We examined how queer and cisgender heterosexual (cishet) participants differed in their empathy for vulnerable populations and their intentions and willingness to follow COVID guidelines (e.g., masking) during the pandemic. We explored political conservatism as a mediating variable in this relationship.

59. Effects of Early Life Pain on Amygdalar Corticotropin-Releasing Hormone Expression in Transgenic Rats

Brooklynn Merrill ’25, Megan Tomasch ’25 |
Michael Burman, Ph.D., Jared Zuke

Neonatal pain increases susceptibility to chronic pain and mental health disorders. We have previously shown that corticotropin-releasing hormone in the central nucleus of the amygdala is involved. Our rodent model mimics the NICU experience through neonatal paw pricks. We will use RNAScope *in situ* hybridization to identify differences in gene expression. The current data demonstrate the feasibility of this project examining changes in the amygdala as a function of age.

60. The Role of CeA Neurons in the Development of Tactile Allodynia and Anxiety-Like Behavior Following Neonatal Trauma

Emma Naess ’23, Ella DiTomaso ’23, Randy Guay ’23 | *Michael Burman, Ph.D.*

We have created a rodent model to test the hypothesis that neurons in the Central Nucleus of the Amygdala (CeA) mediate the development of tactile allodynia and anxiety-like behavior following NICU-like medical trauma. Following painful neonatal manipulations, chemogenetic silencing of CeA neurons during a juvenile stressor is achieved using an inhibitory DREADD approach. A prior experiment silencing CRF-positive neurons in the CeA produced promising yet inconclusive results, and the focus going forward will be silencing of all CeA neurons.

Funding was provided by NIGMS P20GM103643 (Meng PI) and NIMH 1R15HD091841-01(Burman PI).

61. Cognitive Representations of a Pet Affect Stress Levels

Taylor Ryan ’24, Megan Boudreau ’25, Evan Delsignore ’24, Kaleigh Laurendeau ’25 | *Julie Longua Peterson, Ph.D.*

PSY 285 Research Methods

This research compared the stress levels of participants who were asked to cognitively represent their pet versus a control group. We expect stress to be lower in the group that pictured their pet (vs. control).

62. Pet Ownership and Person Perception

Shannon Callaghan ’24, Shauni Ross ’25, Julienne Lussier ’25 |
Julie Longua Peterson, Ph.D.

PSY 285 Research Methods

We explored whether the type of pet (dog vs. snake) influences how people perceive the pet owner. We plan to compare the results between men and women participants to determine if participants’ gender plays a role in this process of person perception.

63. Art and Climate Change

Haley Hines ’25, Bridget Lynch ’25, Leah Palinkas ’25 |
Julie Longua Peterson, Ph.D.

PSY 285 Research Methods

As the climate crisis weighs on our minds, many of us begin to feel anxiety for our futures. Research suggests that our affective states can help to ease or perpetuate that anxiety. Studies have also found that art can prime and produce emotions in observers. Our experiment looks to see if we can take it a step further and directly manipulate one’s feelings about the climate crisis through the analysis of several pieces of artwork.

64. Personality, Generosity, and Narcissism

Gianna Spada ’25, Kelly Deegan ’25, Peyton Stevens ’25 |
Julie Longua Peterson, Ph.D.

PSY 285 Research Methods

We used a quasi-experimental design to manipulate participant perceptions of personal generosity (e.g., recall 2 v. 8 examples of generous behavior) to see the effect on helping behavior. We also explored whether narcissism moderated this effect.

65. Are Epigenetic Changes Responsible for the Lasting Effects of Neonatal Trauma?

Aidan Fox '24 | *Michael Burman, Ph.D.*

Neonates that spend time in the neonatal intensive care unit (NICU) have an increased susceptibility of later-life pain, but the mechanisms remain unknown. The Burman Collaborative has created an animal model of NICU exposure that produces a tactile hypersensitivity later in life. This project examines whether epigenetic changes caused by neonatal trauma are responsible for those effects. We hypothesize that an injection of 5-AzaC, a DNA methyltransferase inhibitor, will reverse the observed hypersensitivity.

Kahn Family Foundation

66. Does Feeling Connected Matter? The Mediating Effect of Social Connection on Cognitive Load and Remote Learning

Emily Newborough '23, Lauryn Alley '24 |
Jennifer Stiegler-Balfour, Ph.D.

Presentation mode and social connectedness may impact cognitive load and learning remotely. Thus, 537 undergraduates watched a pre-recorded lecture with or without the instructor's face, completed a recognition task, and answered questions regarding cognitive load, social connection, Covid-19 concern. Results suggest that cognitive load was the most proximal predictor of student learning and that cognitive load depended on perceived social connection. These findings highlight the importance of understanding the varying components influencing student learning.

This project was supported by an APS grant for Teaching and Public Understanding of Psychological Sciences awarded to Jennifer Stiegler-Balfour.

67. The Role of Age, Technological Experience, and Reading Comprehension Skill in Older versus Younger Adults' Digital Reading Performance

Haley Enos '23, Lauryn Alley '24, Sarah Gray '25, Emily Newborough '23, Gracie Ouellette '24, Grace Sprague '25 |
Jennifer Stiegler-Balfour, Ph.D.

Digital devices are utilized by younger and older adults alike for academic and leisurely reading. Research shows that older adults' usage of e-readers is sometimes accompanied by age specific challenges which negatively impact their use. This study examined whether age, computer experience, technophobia, and reading comprehension skill predict reading performance on digital devices for older and younger adults. Results revealed that computer anxiety and reading comprehension ability were better predictors of performance than age.

The Center for Excellence in Aging and Health; The UNE CAS Summer Undergraduate Research Experience

68. Expository Versus Narrative: Are Different Reading Comprehension Tests Equally Effective at Predicting Students' Comprehension?

Gracie Ouellette '24, Haley Enos '23 |
Jennifer Stiegler-Balfour, Ph.D.

Previous literature has found that reading comprehension is a significant predictor of academic performance. This study used three reading comprehension tests to determine which best predicts comprehension for narrative versus expository texts while also examining the role of working memory and metacognition. Results revealed that some tests are better suited to predict narrative text comprehension whereas others are best for predicting expository text comprehension.

The Center for Excellence in Aging and Health; The UNE CAS Summer Undergraduate Research Experience

69. D1 Dopamine/mu Opioid Receptor Interactions in Operant Conditioning Assays of Pain-depressed Responding and Drug-induced Rate Suppression, and a Conditioned Place Preference Procedure: Assessment of Therapeutic Index in Rats

Hannah LaCourse ’23, Lily Bennett ’26, April Falstad ’25 |
Glenn Stevenson, Ph.D.

This is the first report of *in vivo* dopamine D1/mu opioid interactions on pain, sedation, and drug reward in rats. SKF82958 and methadone were used as selective/high efficacy D1 and mu agonists, respectively. All three SKF82958/methadone mixtures had a higher therapeutic/safety index on pain relief and sedation endpoints relative to drugs alone, and showed no evidence of drug abuse potential. These results suggest D1-selective dopamine agonists have utility as candidate opioid-sparing analgesics.

Kahn Family Foundation

ORAL PRESENTATIONS

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)

Course

ENV 262 Gulf of Maine Field Studies

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.

Presentation Location and Time

Decary 208 | 2:15 p.m.

Funded by

Maine Space Grant Consortium, UNE SURE Program

The Rewriting of "Hazel Hensley": A Dive Into the Revision Process of an Author's Short Story, Artist Book, and the Final Outcome

Peyton Sammons '23 | *Cathrine Frank, Ph.D.*

LIL 420 Arts & Humanities Capstone

This presentation will be an intricate explanation of the revision process for a short story and an accompanying artist book. Character development, setting the scene, and broadening the storyline are all key topics in this presentation. Excerpts of the short story will be read and the artist book will be explained as well.

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

Growing Up Coastal

William Cox '23 | *Cathrine Frank, Ph.D.*

LIL 420 Arts & Humanities Capstone

This presentation is part of a bigger project of reevaluating a previous painting portfolio and creating the start to a new portfolio based as a 22 year old growing up in Maine with inner conflicts and finding myself. With having the safety net of Maine's coast and trees has helped guided me into who I am today from who I was previously. There will be mental snapshots of my personal experiences which I use to create storytelling paintings to help showcase my individual perspective on life and how living in Maine has inspired me to create this new portfolio off of previous work from last semester.

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

Recovering From the War on Drugs

Emily Birdsall ’23 | *Cathrine Frank, Ph.D.*

LIL 420 Arts & Humanities Capstone

Narrative medicine is an essential part of understanding the human experience related to one’s health. It can serve as a way to connect people, normalize an experience or break a stigma. This narrative medicine piece is rooted in the past, present and future of the War on Drugs from the lens of a recovery center and attempts to shed light on the harm this war has had to this community.

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

Then and Now

Zachary Fagan ’23 | *Cathrine Frank, Ph.D.*

LIL 420 Arts & Humanities Capstone

This work is mostly just to display he idea of character growth/ change. The purpose of this work was to revisit my past pieces and this piece takes elements of my journey at college and combines that with the symbolism of two distinct yet joined parts.

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

Why Them?

Alfred Romero ’24 | *Cathrine Frank, Ph.D.*

LIL 420 Arts & Humanities Capstone

Why them? This paper will take a literary and philosophical approach towards answering two major questions that arise out of the “Book of Job”. Three primary sources will each be analyzed, compared, and contrasted with the “Book of Job” to answer Job’s two major questions he has for the Lord at the end of the story. Why must the innocent suffer? Furthermore, would a just God, if one exists, allow for suffering of the innocent?

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

Punker: An Artists Book on Gender and Expression

Beanie Lowery ’23 | *Cathrine Frank, Ph.D.*

LIL 420 Arts & Humanities Capstone

This presentation is a review of the original artists book ‘Is Punk’, and its subsequent revision ‘Punker’ as a humanities capstone project that analyzes personal growth, poetic growth, and artistic growth across the 4 years of study at UNE.

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

Caim and Abel: Revising the Novella

Alex Kiehnau ’23 | *Cathrine Frank, Ph.D.*

LIL 420 Arts & Humanities Capstone

Alex Kiehnau will discuss the revision process of her novella, Caim and Abel, as part of the LIL420 Independent Project. Drawing upon published works, previous courses, and peer review, Alex analyzes and studies craft methodologies regarding creative fiction and will discuss how her writing process changes from the drafting and revision stages.

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

The American and Libyan Case: An Interdisciplinary Approach to Genocide and the Environment

Samantha Mosier '23 | *Ali Ahmida, Ph.D.*

PSC 491 Integrative Essay

I will be reviewing two specific cases, the Libyan genocide committed by the Italian colonialists from 1929-1934, and the American case committed by European colonial settlers from the 16th to 19th century. My goal is to show how these cases are similar in terms of genocides, culture, relationships with the environment, and the fact that they have independent agency.

Decary 206 | 1-1:20 p.m.

Purdue Pharma and the Politics of Opioid Addiction, 1996-2009

Mary Thomasine Wall '23 | *Ali Ahmida, Ph.D.*

PSC 491 Integrative Essay

When Oxycodone first hit the pharmaceutical market in 1996, doctors and nurses were hesitant to prescribe another opioid. Purdue Pharma and salespeople representing them assured medical professionals that this medication would regulate pain without any harmful side effects. In 2007, Purdue was sued. In these cases, Purdue was found guilty of shady marketing practices. However, we still live with the opioid crisis, so how does this continue? This project will aim to answer that question.

Decary 206 | 1:25-1:45 p.m.

Communities Sparking Change

Jeremiah Martinez ’23 | *Brian Duff, Ph.D.*

PSC 491 Integrative Essay

My presentation will be of my senior thesis, where I argue that Community Led Public Health Based programs are better for underprivileged minority communities rather than top down, elite led groups such as the police.

Decary 206 | 1:50-2:10 p.m.

Lean Into the Screen: The Case for a Productive Screen-Based Polity

Antonio Giano ’23 | *Brian Duff, Ph.D.*

PSC 491 Integrative Essay

Technology has rapidly developed into something that the next generation of leaders have grown up with. This presentation will go into the effects that technology has had on this generation in terms of cognitive function as well as political work.

Decary 206 | 2:15-2:35 p.m.

The Effects Anthropogenic Noise Has on the Female House Cricket's *(Acheta Domesticus)* Approachment to a Male Mating Call

Carson Brady '23, Trina Forestier '23, Ashley Peduzzi '23 | *Margaret Stanton, Ph.D.*

PSY 425 Advanced Methods in Animal Behavior

Previous research indicates that female house crickets *(Acheta domesticus)* respond quicker to male mating calls when anthropogenic noise is present. Based on that, we expect that the female crickets will alter their response to the male mating call by responding quicker when presented with natural noises over traffic noises, due to the lingering effects of the anthropogenic noise.

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

The Influence of Predator Chemical Cues on Mating Preference in Female House Crickets *(Acheta Domesticus)*

Korianne Moore '24, Michelle Spies '23, Veronica Fabre '23, Matthew DeMers '23 | *Margaret Stanton, Ph.D.*

PSY 425 Advanced Methods in Animal Behavior

Previous research indicates that sexual selection is stronger in female house crickets when they did not perceive predation risk from the chemical cues of the male. We predict that females will prefer the company of males who have not been exposed to predator chemical cues. Conversely, males who have been exposed to predation chemical cues will be less favorable to the females.

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

Female House Crickets, *Acheta Domesticus*, Ability to Locate Male House Cricket, *Acheta Domesticus*, Calls in the Presence of Anthropogenic Noise

Cameron Capachietti ’23, Nick Ettinger ’23, Nicholas Geren ’23, Sara Poll ’23 | *Margaret Stanton, Ph.D.*

PSY 425 Advanced Methods in Animal Behavior

Previous research has shown that female crickets have difficulty locating male cricket’s call in the presence of anthropogenic noise. Based on those results, we expect that when additional anthropogenic noise is present, the female crickets will have a decreased ability in locating the male cricket’s call. Additionally, when no additional anthropogenic noise is present, we expect the female crickets to favor the side of the enclosure the male cricket is calling from.

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

Comparing Anthropogenetic, Biotic, and Abiotic Noise Impacts on *Acheta Domesticus* Mating Calls

Jackie Osgood ’23, Jackie LaBarre ’23, Nick Vare ’23, Lindsay Rose Smith ’23 | *Margaret Stanton, Ph.D.*

PSY 425 Advanced Methods in Animal Behavior

Based on previous studies on the impact of different sounds on cricket calling behavior cricket calling was found to be interrupted by the presence of mining trucks compared to other biotic noises (Duarte et al. 2019). For our study we used rain, traffic, and bat noises. Our hypothesis is that mating calls will increase in the presence of biotic noise compared to abiotic noise, which will be increased compared to anthropogenic noise.

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

Effects of Anthropogenic Noise on Male Cricket *(Acheta Domesticus)*

Fenya Grew ’23, Adryona Miller ’23, Casey Wood ’23, Cassidy Pacheco ’24 | *Margaret Stanton, Ph.D.*

PSY 425 Advanced Methods in Animal Behavior

The purpose of this study is to observe how male crickets respond to different lengths of exposure to anthropogenic noise. The signaling rate and activity level of the male crickets will be observed as a way to study anthropogenic noise.

Decary 207 | 2:40-3 p.m.

The Effects of Anthropogenic Noise and Predator Sound Cues on Locomotion and Emergence in House Crickets *(Acheta domesticus)*

Courtney McColgan ’23, Jon Last ’23, Rachel Kaplan ’23, Marley Cloutier ’23 | *Margaret Stanton, Ph.D.*

PSY 425 Advanced Methods in Animal Behavior

Prior research suggests that crickets exposed to predator scent cues will exhibit higher rates of evading predation and a longer latency to emerge from safety. In addition, crickets exposed to anthropogenic noise pollution will exhibit reduced locomotion. We expect that when house crickets *(Acheta domesticus)* are exposed to anthropogenic noise or predator sound cues, they will reduce locomotion, spend less time outside of a shelter and show an increase in latency of emergence from hiding.

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

Creation of the Novella: A Reading and Discussion of Caim and Abel

Alex Kiehnau ’23 | *Jesse Miller, M.F.A*

Alex Kiehnau will discuss the creative process behind her novella, Caim and Abel. Drawing upon published works, previous courses, and advisor peer review, Alex analyzes and studies craft methodologies regarding creative fiction and will discuss her personal writing process. Alex will also read portions of her novella and discuss the inspiration behind specific scenes.

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

What’s That Compound? Structural Characterization of Antimicrobial Pyrogallol-based Ketones with Varying Hydrocarbon Chain Lengths

Carolyn Curley ’23 | *Amy Deveau, Ph.D.*

Antimicrobial resistance to the gram-positive pathogen *Staphylococcus aureus* is one of the leading public health threats today. In this talk, an analysis of nuclear magnetic resonance (NMR) and infrared spectroscopy and mass spectrometry data of synthetic antimicrobial compounds will be presented. The data will be synergized and used to deduce the structures of the antimicrobial compounds.

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

Stimuli-Responsive Behavior of a Highly Charged Elastin-Like Polymer: A Dynamic Light Scattering Study for Biosensing Applications

Peter Swanson '24 | *Eva Rose Balog, Ph.D.*

We investigate the stimuli-responsive behavior of an elastin-like polymer, nicknamed "KI8," in response to environmental variables using dynamic light scattering. This study focuses on measuring the hydrodynamic size, zeta potential, and physical polymer attributes such as flexibility and Kuhn length. Elucidating how KI8 responds to different stimuli such as temperature, pH, and ionic strength, and how these environmental variables affect its behavior will aid in the development of new biomaterials with tailored properties for biosensing applications.

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

NSF EPSCOR

DIRECTORY

POSTERS BY AUTHOR

ORAL PRESENTATION SCHEDULE

	Decary 205	Decary 206	Decary 207	Decary 208
1:00 – 1:20 p.m.	Cox, Sammons	Mosier	Bradier, Forestier, Peduzzi	Kiehnau
1:25 – 1:45 p.m.	Fagan, Birdsall	Wall	Moore, Spies, Fabre, DeMers	Curley
1:50 – 2:10 p.m.	Lowery, Romero	Martinez	Capachietti, Ettinger, Geren, Poll	Swanson
2:15 – 2:35 p.m.	Kiehnau, Roundtable	Giano	Osgood, LaBarre, Vare, Smith	
2:40 – 3:00 p.m.			Grew, Miller, Wood, Pacheco	
3:05 – 3:25 p.m.			McColgan, Last, Kaplan, Cloutier	

THANK YOU

THANK YOU!

The 23rd 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.

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 also to the many faculty and professional staff members who have volunteered their time and expertise to assist with today's event. Appreciation is also extended to UNE Institutional Advancement, Conference Services, and the Office of Communications for their help executing our event.

Several agencies have sponsored the students' research through fellowships and grants, including the Kahn Family Foundation, UNE Office of Research and Scholarship, the UNE CAS Summer Undergraduate Research Experience program, the National Institutes for Health, the National Oceanic and Atmospheric Administration, the Boettcher Foundation, the Association for Psychological Science, UNE Center for Excellence in Health and Aging, Save Our Seas Foundation, Georgia Aquarium, Jim Searing, and the Maine Outdoor Heritage Fund.

Finally, a warm thank you to Noelle Maibaum for assistance with poster printing and Erinn Stetson for her dedication to making this symposium a success year after year.

—Dr. Amy Keirstead

UNE

UNIVERSITY OF
NEW ENGLAND

INNOVATION FOR A HEALTHIER PLANET