Ohio Wesleyan University

SPRING STUDENT SYMPOSIUM

APRIL 17, 2025
4:10-6:00 PM | MERRICK HALL

The Symposium provides an opportunity for students to share their work with the OWU Community and enter a dialogue that can spur ideas for new projects.

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Dr. David Markwardt, Associate Dean of the OWU Connection — 4:10-4:15

- Choral Performance

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THE SPRING STUDENT SYMPOSIUM

The Spring Student Symposium showcases the research and creative work of Ohio Wesleyan students across the academic spectrum.

The Symposium provides an opportunity for students to share their work with the OWU community and enter a dialogue that can spur ideas for new projects.

Undergraduate research, scholarship, and creative projects conducted and performed under the mentorship of expert faculty are central components of The OWU Connection. The annual Student Symposium shows the breadth, innovation, and quality of work produced by Ohio Wesleyan students.

THE OWU CONNECTION
THINK BIG. DO GOOD. GO GLOBAL. GET REAL.

BOARD 1A

NOAH SCHNOOR '26
MARISSA SIEGEL '25
TIM ALEXANDER '25

TARGETED INJECTION THERAPIES FOR TMD: REVIEW OF HYALURONIC ACID AND BOTOX TECHNIQUES

Faculty Mentor: Professor Elizabeth Starns
Department of Health & Human Kinetics

Objective: This study aimed to evaluate how injection therapies can help reduce the symptoms created by temporomandibular joint disorders (TMD) and answer the research question, how do botulinum toxin (onabotulinumtoxinA, Botox) and hyaluronic acid (HA) injections affect symptoms of temporomandibular joint disorder (TMD)?

Methods: An electronic search of three databases was performed using the search terms "Treatment of TMD or TMJ" and one of the following: 1) "Hyaluronic Acid Injection" or 2) "Intramuscular Botox Injection".Based on studies done with human patients, the effects of both hyaluronic acid and Botox injections as treatments for TMD were observed and analyzed. Inclusion criteria were: full articles in English, studies conducted in North America or Europe, and articles published from 2015 to the present. Review articles and abstracts-only were excluded.

Key Findings: A total of 23 sources were found and analyzed; nine related to Botox and 14 related to HA. Eight of the nine Botox articles showed a reduction in overall symptoms. Six showed a reduction of pain based on the visual analogue scale (VAS) score, and three showed an increased range of motion. Out of the 14 articles related to HA, 14 showed a reduction in pain based on the VAS scores, and 11 showed an increased range of motion.

Conclusions: About half of studies indicate that Botox can reduce pain and increase joint range of motion. Compared to HA, almost all studies showed a decrease in pain and an increase in range of motion. This indicates that both treatment methods were associated with successful treatment of TMD symptoms. However, HA was most effective in treating symptoms of TMD.

BOARD 1B

AUBREY GERHARDT '25

IDENTIFICATION AND CHARACTERIZATION OF NOVEL NEMATODES

Faculty Mentor: Proffessor Danielle Hamill
Department of Biological Sciences

Nematodes are an important class of organisms for agriculture, medicine, and the environment; however, many are uncharacterized due to their abundance and variety. In our study, two potentially new species of nematodes were investigated in comparison to a described species, O. myriophila, for reproductive, molecular, and morphological differences. Crosses between the different types of nematodes were scored for viable male progeny, an indicator that successful reproduction occurred. Male progeny were not observed in crosses between the three different worm types indicating reproductive isolation. To investigate why no viable out-cross progeny were produced, marked mating experiments were conducted. We stained the sperm of one type of worm and mated it into hermaphrodites of the same or different types to determine if there was copulation and subsequent fertilization and development. In crosses between worms of the same type, stained sperm was found in the uterus and often both spermathecae, and male progeny were produced. In crosses between two potentially different species, stained sperm were observed in the uterus of most hermaphrodites, however, it often did not reach the spermathecae and no male progeny were seen. This shows that sperm gets into the hermaphrodite, but can not fertilize the eggs to produce viable progeny. To further explore whether these worms are different species, we sequenced parts of two highly conserved genes. Specifically, we amplified and sequenced a nuclear gene (18s rRNA) and a mitochondrial gene (cox1). The sequences of these genes varied from 1-8% between the different types of worms (See H. Stover Poster). Finally, we carefully measured the worms and saw several morphological characteristics that appeared to differ. Taken together, these results suggest we are studying previously undescribed species of nematodes, which furthers our understanding of this important group of organisms.

BOARD 2A

ZANE VITENSE '26
JACOB LOWERY '27
ABRAM BEER '26

DRIVING ECONOMIC INSIGHT AND THE SECTORAL IMPACTS OF ENERGY AND VEHICLE MARKETS

Faculty Mentor: Professor Goran Skosples
Department of Economics & Business

Throughout the semester, our team released three economic newsletters focused on the transportation and energy sectors. These newsletters analyzed the Chicago Fed National Activity Index (CFNAI), crude oil production levels in the United States, and overall automobile sales. Each newsletter highlighted newly released data, revisions to earlier published reports, and the general economic context for each variable. In the first edition, we introduced each index, explained their past patterns, and provided initial projections. CFNAI recently surged to 0.15, crude oil production saw its typical seasonal decline from October highs, and auto sales were at a December high of 16.79 million units—a normal year-end trend for customers. In our second newsletter, we verified how right our initial predictions had been and included new values, such as the CFNAI rising again and car sales falling as we forecasted. Crude oil production remained relatively stable, as we forecasted. In our third newsletter, we looked at the usefulness of these indicators over time, how they were consistent with one another, and what they signaled about the economy's health at the time. While CFNAI reflected continued economic momentum, weakening vehicle sales underscored consumer caution, and oil production trends indicated steady, disciplined production. We included authentic release dates, tables, and visual graphs throughout all three editions to confirm our findings. The consistent format and regular updates allowed us to follow movements in the sector while honing our awareness about key trends. Ultimately, the newsletters provided an honest, easily digestible snapshot of how such elementary indicators trended and what implications this had concerning the economy heading toward the second quarter of 2025.

BOARD 2B

MATTHEW LEIBOLD '26
FIONA MINTON '25

OTTERLY AMUSING: A COMPARATIVE STUDY OF PLAY BEHAVIOR ACROSS THREE COMMON OTTER SPECIES

Faculty Mentor: Professor Shala Hankison
Department of Biological Sciences

Play behavior is a crucial aspect of mammalian development and social interaction, yet its expression varies between species. This study compared the relative play times of three otter species: Asian small-clawed Otters (Aonyx cinereus), North American River Otters (Lontra canadensis), and Sea Otters (Enhydra lutris) to explore species-specific differences in playfulness. Using a combination of direct observations at the Columbus Zoo & Aquarium, supported by the OWU Connection Grant, and webcam footage, we comparatively quantified play type and duration. Statistical analysis (ANOVA) assessed interspecies variation and potentially showcases additional factors that influence otter behaviors. Findings from this research will contribute to understanding behavioral ecology and enrichment strategies for captive otters.

BOARD 3A

SPENCER YATES '25

MORPHOLOGICAL ANALYSIS OF FLEA SPECIES USING SCANNING ELECTRON MICROSCOPY

Faculty Mentor: **Professor Ramon Carreno**
Department of Biological Sciences

Fleas are macroscopic parasites found all across the globe that feed on blood. Fleas are typically host specific, which can lead to many minor morphological differences between species. Due to their size, light microscopy has been the most common method for observing morphological structures, but it is limited in the capacity to see higher magnifications at a good resolution. As such, the use of a scanning electron microscope (SEM), which uses a focused beam of electrons to view highly magnified objects at high resolution, facilitates greater resolution to determine the morphological differences between flea species. We imaged thirteen different flea species (eleven species with both a male and a female, two with just a female) using the SEM, identified the unique traits of each species, and compared these traits across the thirteen species. We were able to clarify structures previously difficult to image, such as the setae in the femur and tarsal leg regions, genal and pronotal combs, and planar bristles. Our findings indicate that for future flea studies, the use of an SEM will help with observation accuracy.

BOARD 3B

ADIA SZELL '27
AIDA GESINK '27

FOOD AND GENDER ROLES: US AND CUBA

Faculty Mentor: **Professor Elizabeth Nix**
Department of Health & Human Kinetics

Throughout history, women's role in food preparation has been central to many cultures. This study compares gender roles in food preparation in Cuba and the United States, highlighting their similarities and differences. In both countries, women have traditionally been responsible for cooking and ensuring their families are fed. However, the collapse of the Soviet Union led to starkly different outcomes. In Cuba, the Special Period caused severe food scarcity and resource shortages, forcing women back into the kitchen and undoing previous progress in gender roles. In contrast, in the U.S., the rise of processed foods in the 1960s and 1970s contributed to a feminist liberation movement, easing women's domestic responsibilities and allowing them to engage more fully in society.

BOARD 4A

MEGAN MCCARTHY '25
LINDSAY WOLVERTON '25

HABITAT-ASSOCIATED GUT MICROBIOME VARIATION IN THE COMMON WALL LIZARDS (PODARCIS MURALIS)

Faculty Mentor: Professor Andrea Suria
Department of Biological Sciences

Environmental factors influence the gut microbiome of wildlife, impacting health, adaptation, and survival. Investigating how microbiomes respond to different environmental changes may provide insight into their role in species survival and fitness in new environments. The common wall lizard (Podarcis muralis) is an invasive species in Cincinnati, Ohio, that inhabits both urban and forested environments. This makes it an ideal model for examining habitat-associated gut microbiome variation. This study compared the microbiome composition of P. muralis populations from Ault park and Alms park, from both forested and urban areas, as well as a captive colony at Ohio Wesleyan University. Lizard fecal samples were flash-frozen and DNA was extracted using the QIAamp PowerFecal Pro DNA Kit. The V3 and V4 regions of the 16S rRNA gene were sequenced from 63 samples, including 3 negative kit controls. Microbiome composition was analyzed in QIIME2 and RStudio with the vegan and MaAsLin2 packages. An average of 408±232 Amplicon Sequence Variants (ASVs) were observed. Alpha diversity metrics, including Shannon diversity, observed features, evenness, and Faith's phylogenetic diversity showed no significant differences, indicating similar microbiome richness across habitats. Beta diversity metrics, including Bray-Curtis, Weighted Unifrac, and Unweighted Unifrac, were also analyzed. A statistical difference was observed between the captive and urban lizard subgroups using Bray-Curtis analysis. Additional analyses of sex, capture date, and gravid state showed no strong correlations with microbiome variation.
We hypothesized that microbiome composition differs with habitat, possibly due to differences in available food sources. The findings suggest that habitat may not drive significant difference in microbiome composition of P. muralis populations in Cincinnati. This may contribute to their success and adaptability in novel sites. Future research will examine differences in diet and expand sampling to additional locations to clarify habitat-related microbiome patterns and their implications for lizard survival in urban environments.

BOARD 4B

WASIF KARIM '26

AUTONOMOUS SELF DRIVING CAR

Faculty Mentor: Professor Hanliang Guo
Department of Mathematics & Computer Science

The development of autonomous vehicles has the potential to revolutionize transportation by improving safety, efficiency, and accessibility. This independent study focuses on building a fully autonomous self-driving car using the NVIDIA Jetson Orin Nano Developer Kit, VESC motor controller, servo system, RPLIDAR C1, Radiomaster GPS, and a USB camera. The goal of this project is to enable real-time navigation using computer vision and LIDAR-based mapping, allowing the car to autonomously drive in both indoor and outdoor environments.

The system integrates sensor fusion techniques, combining LIDAR, GPS, and computer vision for precise localization and obstacle detection. A convolutional neural network (CNN) processes camera data to identify lanes and objects, while Simultaneous Localization and Mapping (SLAM) is employed for environment mapping. The car's motion planning is governed by a PID controller, ensuring smooth trajectory tracking. Additionally, a custom-built central control system manages real-time decision-making and allows the vehicle to switch between manual and autonomous modes.

Testing was conducted in controlled environments, evaluating the car's ability to navigate predefined routes, avoid obstacles, and reach selected destinations using Google Maps. Preliminary results demonstrate reliable autonomous navigation, with challenges identified in dynamic obstacle avoidance and GPS-denied environments. Future improvements include enhancing deep learning models for object recognition, improving real-time LIDAR processing, and optimizing hardware for energy efficiency.

This study provides a scalable framework for self-driving applications in robotics and automation. The findings contribute to the growing field of autonomous systems, offering insights into sensor integration, control algorithms, and real-world deployment challenges. The project showcases the feasibility of low-cost, autonomous navigation solutions, paving the way for further advancements in self-driving technology.

BOARD 5A

MORGAN VAUGHN '26
ELLIE DODDS '25
DEKON HARPER '28
LEXI REITER '28

MYSTERIES IN THE HERBARIUM: COMPARING HERBARIUM SPECIMENS TO KNOWN XYLOPIA SPECIES

Faculty Mentor: Professor David Johnson
Department of Biological Sciences

Annonaceae is a family of plants found primarily in the tropics. In Brazil, there are approximately 385 species among 30 genera that have been identified. Xylopia is one of the most species-rich genera of Annonaceae in Brazil, and new species within the genus are still yet to be defined. In a comprehensive study of the genus Xylopia, several herbarium specimens were identified that did not appear to fit previously described species. Using these specimens we are collecting data on twig, leaf, fruit, and seed characteristics to determine whether or not these specimens represent an undescribed species. All of our herbarium specimens that have buds or flowers exhibit cauliflory, which is only found in a handful of Xylopia species. We believe that our specimens are related to X. ochrantha and X. peruviana. Xylopia ochrantha and X. peruviana share many characteristics and are listed next to each other on Xylopia identification keys, but their distributions are different: X. peruviana is found to the west of our specimen distribution, while X. ochrantha is found to the east. Because they each have traits that are similar and dissimilar to the specimens that we have, we hope that comparison will allow us to solidify identifications for our specimens. Identifying this new species is important to help us understand the extent of diversity in Xylopia. Having a full understanding and identification criteria allows us to identify this species in the field, and relate it to other species within the genus. Future applications of this research could include discovering species interactions with local flora and fauna, or medicinal uses of this plant.

BOARD 5B

JOSHUA ADJEI '26
JILLIAN BELTON '26
RADHIKA AGRAWAL '26
RYLEIGH TILLMAN '26

ANALYZING BUSINESS TRENDS FROM THE FIRST QUARTER TO THE BEGINNING OF SECOND QUARTER

Faculty Mentor: Professor Goran Skosples
Department of Economics & Business

Understanding economic trends requires consistent monitoring of key indicators. This newsletter examines the latest updates on Wholesale Trade, Producer Price Index (PPI), ADP Private Employment, and the Baker Hughes Crude Oil Rig Count. These indicators provide insight into the economy's current state and future trajectory.

BOARD 6A

ISABEL ALLO '26

AGROECOLOGY: A CHOICE OR NECESSITY? COMPARING THE RESILIENCE OF THE CUBAN AND UNITED STATES FOOD SYSTEMS

Faculty Mentor: Professor Elizabeth Nix
Department of Health & Human Kinetics

Cuba has been praised for its incredibly green and sustainable agriculture practices like using compost, seasonal growing, and the incorporation of pollinators. This use of agroecology has been seen as a great achievement from the point of view of environmental progress, which it may very well be. However, the origins of these practices directly stemmed from the necessity to combat economic and food insecurity issues post Soviet-Union collapse. This time, also known as the Special Period, forced Cuba to face its greatest challenge: rising back up from incredible defeat. Revamping their food system the way they did was an essential solution to the food shortages, rations, and reduced agricultural imports. As the United States' food system fluctuates with similar issues, the question is raised: are we heading towards this same level of crisis? Our current efforts to combat these crises (sustainable and local agriculture efforts) are not supported and cannot operate financially or realistically the same way as our industrial farming does. The key piece here is remembering that our industrial food system is becoming increasingly vulnerable as our current administration is cutting funding to agricultural and food distribution programs, along with severing our allies that support our large scale level of food imports. An important comparison can be made through looking at economic and political repercussions from the Special Period to current U.S. executive orders and projected outcomes. Additionally, investigating where the U.S. is right now with their agricultural practices and where changes can be made.

BOARD 6B

ALEX BZDAFKA '27

SUPPORTING NATIVE PLANT AND POLLINATOR PROJECTS IN CENTRAL OHIO

Faculty Mentor: Professor Laurel Anderson
Department of Biological Sciences

Urban and suburban areas have been leading causes of habitat fragmentation and degradation; this has led to initiatives and projects trying to establish new habitats for animals to live in and travel through. Delaware Hayes high school is one such project, they are installing a prairie and other small habitats on their property. We have taken soil samples and will be testing for soil organic matter (SOM) content, along with soil nitrogen, phosphorus, and potassium. These are all preliminary measurements for a long term monitoring study where we intend to track the effect the instillation of these ecosystems have on the soil quality and how the resulting plant communities effect the suitability for pollinators to inhabit. We expect to see an increase in SOM content as time passes.

BOARD 7A

SEAN CONNELLY '27
NATHAN ZUNIGA '25
LUKAS MUENCH '26
MARCUS VALCOURT '26

FORECASTING THE WORKFORCE: LABOR MARKET INSIGHTS FROM EMPLOYMENT TO EARNINGS

Faculty Mentor: Professor Goran Skosples
Department of Economics & Business

This project examines recent trends in U.S. labor market indicators using four key variables: nonfarm payroll employment, the unemployment rate, average hourly and weekly earnings, and the Job Openings and Labor Turnover Survey (JOLTS). These indicators provide varying perspectives on labor market conditions and offer key insights for economic analysis and policy evaluation. Each variable was analyzed in terms of its definition, data collection methodology, historical trends, and current readings. Forecasts are also provided for insight of future developments. Employment and the unemployment rate, both considered lagging indicators, were evaluated alongside leading indicators such as job openings to determine the robustness and predictive power of the labor market metrics. Notably, recent declines in the unemployment rate and steady gains in employment suggest resilience in the labor market despite broader economic uncertainties. However, divergences across the indicators such as increasing wages amid fluctuating job openings, presents the complexity of labor market dynamics. Forecasts project continued growth in employment and wages, a slight decline in unemployment, and increased job openings, underscoring expectations of labor market strength moving forward. This analysis enhances our understanding of labor sector trends and provides a foundation for evaluating future monetary policy decisions.

BOARD 7B

JENNIFER VELASQUEZ '27

ANTIMICROBIAL ACTIVITY OF OAK BARK

Faculty Mentors: Professor Laurel Anderson & Professor Andrea Suria
Department of Biological Sciences

During the Civil War, the use of native plants for medicine increased because of the lack of other medicines. This problem caused people to do research on oaks to see if they had any properties which could help with diseases and infections. In this study, we tested Quercus alba (white oak) and Quercus rubra (red oak) for antimicrobial properties of oak bark. In Kraus Preserve, we gathered one piece of bark from eight trees, four red oaks and four white oaks. Bark was stored in the refrigerator until analysis. For antimicrobial analysis, we cut the bark into little pieces, mixed them with ethyl acetate and water and left them on a rocking platform to mix. After 48 hours, we separated the organic and the aqueous solution into tubes. In a small tube, we mixed saline with Staphylococcus epidermidis until it turned into a cloudy solution. With a swab we spread this solution onto four agar plates. We labeled each plate and placed five disks on each plate, having one for the control group, two organic and two aqueous. We pipetted 10mL of the solutions into each disk. We placed these plates in a bag and left them in the incubator with a temperature of 37°C. We plan to measure the area of bacterial death around each disk. Results are forthcoming.

BOARD 8A

KAIA VORENKAMP '27
CARLEY LOUNSBURY '25

AJIACO: A CULINARY EXPRESSION OF CUBA'S SYNCRETIC HISTORY

Faculty Mentors: Professor Elizabeth Nix & Professor Chris Fink
Department of Health & Human Kinetics

The complex multi-cultural interactions between several groups on the island of Cuba have shaped Cuban cuisine throughout history and continue to develop it today. Ajiaco, a traditional Cuban soup dish, serves as a powerful reflection of the island's syncretic history, blending prominent aspects of African, Spanish, and indigenous customs and practices. Inspired by similar research conducted by Fernando Ortiz, our research explores how ajiaco preserves and represents Cuba's faceted cultural heritage. By examining the dish through the lens of cultural syncretism, our study highlights the ways in which ajiaco embodies the fusion of diverse traditions that have been shaped by the islands' colonial past, the presence of African diaspora, and indigenous practices. Through this analysis, our research demonstrates that ajiaco is more than just a culinary product or a staple food. Rather, it is a testament to the fluid and dynamic relationships between cultures, offering insight into the resilience and adaptability of Cuban identity, La Cubanidad. This presentation underscores the role of food in maintaining cultural memory and identity, providing a deeper look at how Cuba's syncretic history continues to be reflected and preserved in everyday life.

BOARD 8B

BROCK CORRY '26
JEREMIAH OSEI '27
LANE HOWARD '27
JASON QUARTSON '26

HOUSING TEAM DATA NEWSLETTER

Faculty Mentors: Professor Goran Skosples
Department of Economics & Business

This project analyzes the current state of the U.S. housing market by tracking four key indicators: MBA Mortgage Applications, New Home Sales, Existing Home Sales, and the Case-Shiller U.S. National Home Price Index. Using real-time data collection and macroeconomic theory, the team monitored trends across three newsletters over the semester to evaluate how each indicator reflects market conditions and consumer behavior. Mortgage applications, a leading indicator, captured shifts in buyer sentiment and financing conditions in response to falling interest rates. However, purchase activity lagged refinances, revealing affordability barriers not fully captured by theory. In contrast, New and Existing Home Sales acted as lagging indicators, confirming consumer hesitancy and supply-side constraints. The Case-Shiller Index, also lagging, showed persistent price increases driven by tight inventory despite declining sales volume. Through comparative analysis, the project found that while the indicators varied in timing and emphasis, they collectively pointed to the same underlying theme: strong price pressures and limited housing supply continue to weigh on buyer activity, even amid easing rates. These findings suggest limited short-term responsiveness to monetary policy alone, indicating the need for broader housing policy interventions. Forecasts show modest growth in mortgage applications and prices but stagnant sales. This project demonstrates the value of combining real-time indicators with economic models to track housing trends and underscores the importance of understanding how theory interacts with market complexities.

BOARD 9A

LAUREN DORSEL '26
CAMILLE PAYNE '26
ALANA WILSON '26
KIKI RUSSELL '28
CAROLINE O'MALLEY '28

NOT JUST "CONGRESSMEN IN COMMITTEES:" AN INTERSECTIONAL, COMMITTEE-LEVEL EXPLORATION OF US HOUSE COMMITTEE MEMBERSHIP PATTERNS FROM THE 80TH-118TH CONGRESS

Faculty Mentors: **Professor Franchesca Nestor**
Department of Politics & Government

The 119th Congress is the first since 2011 with fewer women legislators than the Congress
before it, and the standing committees of the US House will include no women chairs. Less
mentioned so far is the resulting impact on committee membership patterns. When overall
representation of gender and/or ethnic groups in the congressional chamber declines, the reduced representation of those subgroups on committees is even more pronounced. The scholarly literature has tended to examine committees with an eye toward individual members, considering individual committee preferences, individual committee participation, and individual movement into committee leadership positions. Many intersectional approaches to these questions also explore how individual members navigate the committee system. This paper, instead, explores committees at the committee level, utilizing a new dataset which provides an intersectional look at US House standing committees from the 80th to 118th Congresses. We show committee membership patterns for women MCs, Black MCs, Latino and Latina MCs, and AAPI MCs. Over time, what committees tend to include which members? How might these findings relate to theories on committee prestige, committee jurisdiction, and committees as party tools? Our committee-level, intersectional approach yields varied and important insights about whom in Congress, and beyond, committees represent.

BOARD 9B

ANYA SHEVCHIK '26

PERFORMING UNDER PRESSURE: HOW MORPHOLOGY AFFECTS LOCOMOTION OF A SAND-SWIMMING SKINK

Faculty Mentors: **Professor Eric Gangloff**
Department of Biological Sciences

An animal's morphology directly influences its ability to perform fundamental tasks, which can be vital to its survival and reproduction. This is especially true in harsh or extreme environments, such as The Sahara. Despite being common across a broad geographic range – and an important food source to some human populations – little is known of the natural history of the sandfish skink (Scincus scincus). Building upon our past work on the thermal biology of this sand-dwelling lizard, we conducted an experiment to test how body size and dimensions affect performance at optimum temperatures. We quantified three different types of movement: sprinting (hunting behavior), diving (escape behavior), and sand swimming, a unique form of locomotion for these animals. We measured multiple morphological characters, including toe, leg, head, and body size, using digital calipers. We then tested how this multivariate morphological phenotype impacted performance measures and assessed potential trade-offs. Further, we searched for patterns of sexual dimorphism and how morphology-performance relationships potentially differ between the sexes. Overall, this experiment provides insight into morphology-performance relationships across a number of ecologically important aspects of locomotion in this unique lizard, including the novel measures of swimming speed within the sand. Looking forward, we hope to leverage these data to illuminate ecological drivers of sexual dimorphism and to characterize the unique adaptations that allow this species to flourish under such intense conditions.

BOARD 10A

HUNTER RHOADES '27

ALL TOGETHER NOW-- A UNIFIED APPROACH TO HEALTH

Faculty Mentors: Professor Chris Fink
Department of Health & Human Kinetics

Ohio Wesleyan University's Public Health, Biology/Zoology, and Environmental Science programs draw many students. However, to date, there hasn't been intentional interdisciplinary structure to tie these areas together to explore infectious disease internationally, identify links between animals, humans, and the environment, and encourage collaboration to promote the welfare of our environment and its associated factors. One Health does just that, as it is an integrative, unifying approach to balance and optimize the health of people, animals, and ecosystems. This poster will focus on a project from the Spring 2025 semester, in which I explored the background, successes, and challenges of One Health initiatives on college campuses around the U.S.. In addition, I developed a plan to discuss bridging the gap between the environmental sciences, health sciences, and veterinary sciences to create a more universal focus on humans in addition to animals and the environment. I developed background writing and sources aiming to gain more information about where the gaps and opportunities lie for these three areas. A collaborative meeting was then planned with faculty members from the Health and Human Kinetics/Public Health, Environmental Science, and Biology/Zoology departments in hopes to gain support of my initiative. Furthermore, I met with epidemiologists from Delaware Public Health District (DPHD) to hear more about their definition and DPHD initiatives regarding One Health. As a result, we found that One Health initiatives are growing across the nation as the world further understands a need to connect all forms of health, specifically since the COVID-19 pandemic. In addition to focusing on the background work and methods for this project, I will provide findings and next steps for integrating these areas into a potential One Health initiative at OWU.

BOARD 10B

GABRIELLE PLUNKETT '25
TYLER WILLIARD '27

WHAT FACTORS AFFECT THERMOREGULATORY DECISIONS IN COMMON WALL LIZARDS (PODARCIS MURALIS)?

Faculty Mentors: Professor Eric Gangloff
Department of Biological Sciences

The ability to effectively thermoregulate is important for most ectotherms, since body temperature determines the rate of nearly all physiological processes. However, for most organisms we lack understanding of which environmental factors affect thermoregulatory behaviors and their behavioral patterns over an entire day. Introduced populations of the common wall lizard (Podarcis muralis) in Cincinnati, Ohio, USA are thriving after an introduction 70 years ago. Notably, they display increased thermophily compared with native European populations. To non-invasively quantify daily thermoregulatory behaviors, thermoregulatory effectiveness, and variation across populations, we used infrared thermography (a thermal imaging camera) to conduct repeated standardized surveys every 30 minutes across their normal activity period (08:00 to 20:00) in multiple locations. We also measured wind speed, air temperature, humidity, solar radiation, and UV radiation while 3-D printed operative temperature models measured potential available temperatures throughout the activity period. Wall lizards are highly effective thermoregulators, though activity time is limited by available environmental temperatures even on extremely hot days. Further, high levels of UV exposure limit activity, even when temperatures are favorable. Such data on daily activity and thermoregulatory decision-making, especially in an urban habitat, provides great insight into how wall lizards can thrive in cities and have the potential to expand their current range.

BOARD 1A

ATHENA KOLETTIS '26

THE DARK SIDE OF COFFEE

Faculty Mentors: **Professor Elizabeth Nix**
Department of Health & Human Kinetics

In Cuba, coffee can be both a morning pick-me-up and a nighttime refreshment. Coffee is a drink that is idolized in Cuba because of its prominence in Cuban history as well as its current scarcity. José Antonio Gilbert, Cuba's chief accountant in the 18th century, was the first to introduce coffee to Cuba in 1748. Soon after Cubans began production, French colonists imposed their production practices, believing they were superior. Along with culinary practices, the French also brought the slave trade. African slaves were the primary manual laborers that helped make the coffee plantations flourish. Since the eradication of slavery in the 19th century, the number of coffee plantations throughout Cuba has decreased, resulting in a decline in the production and accessibility of coffee to the Cuban people. Coffee used to be an attainable drink when it was first brought to the island, making it a prevalent symbol of Cuban culture. However, today's government policies regulate farming and labor practices by taking 90% of coffee exports to other countries, which has made coffee in Cuba today less of a cultural icon and more of a luxury item. We visited the 19th-century French coffee plantation of Buenavista, in Las Terrazas, which enhanced our understanding of this history. We also made our own observations while visiting other rural communities and farms that created their own coffee due to the scarcity. Through these observations—and by savoring many cups of coffee—we observed how a non-native product became a staple in the Cuban culture despite it being a rarity to its people.

BOARD 1B

CAMILLE MATTOX '27

VERNAL POOL PHENOLOGY PROJECT

Faculty Mentors: **Professor Laurel Anderson**
Department of Biological Sciences

With rising global temperatures, indicator species like salamanders are important to study in order to gauge how the surrounding environment will react to climate change. To understand how the rest of the ecosystem is affected, plants sharing the environment with salamanders are also studied. Monitoring the important life events of woody plants and spotted salamanders gives us insight into how climate change is affecting the environment. To do this, we studied vernal pools which are the temporary or permanent bodies of water in which amphibians often breed in. Their lack of fish populations makes vernal pools a prime breeding ground with decreased predation. We visually surveyed for spotted salamander spermatophores and eggs from the edge of the pool. We also visually (with the help of binoculars) surveyed the trees for bud breaks. A depth gauge was used to monitor the water level and HOBO data loggers monitored air and water temperatures. From previous research, we expect that as temperature increases globally, the breeding patterns of spotted salamanders will occur earlier in the coming years.

BOARD 2A

MATTHEW LEIBOLD '26
COOPER CHRISTIE '26

BLOCK BY BLOCK: THE BUILDING OF PROCEDURAL TERRAIN GENERATION

Faculty Mentors: Professor Sean McCulloch
Department of Mathematics & Computer Science

Procedural generation is a cornerstone of open-world games, enabling vast, dynamic environments that feel organic while remaining computationally efficient. This study investigates the world generation algorithms in Minecraft, a game that has captivated millions with its algorithmically crafted landscapes. By analyzing the game's base files, we aim to unravel the mechanics behind terrain formation and biome distribution. At the heart of Minecraft's world generation is Perlin noise, a gradient-based noise function that is the basis for creating natural-looking terrain and biome transitions. To deepen our understanding of procedural generation, we recreated Perlin noise in Unity and compared it to three alternative algorithms: Simplex, Worley, and Fractal Brownian Motion (FBM). Each of these noise functions influences terrain generation differently, impacting visual features and code writing related to time complexity. By generating and visually comparing terrain outputs from each noise function using identical seeds, we examined how these noise functions affect terrain continuity, elevation variation, and overall world realism. Our study combines computational theory and practical implementation, demonstrating how procedural techniques balance randomness with structured predictability. By analyzing Minecraft's world generation, we gain insights into broader applications of noise functions in digital landscapes, from game development to environmental simulation and beyond.

BOARD 2B

KEVIN TEGA '27
LUKE BEESE '26
ELI BURGESON '26

ECONOMIC NEWSLETTERS: INTERNATIONAL SECTOR AND VARIABLES

Faculty Mentors: Professor Goran Skosples
Department of Economics & Business

This presentation will consist of three newsletters, covering the international sector of the economy and related factors, compiled together in to one presentation. The factors included in this presentation are as follows; U.S. International Trade in Goods and Services, Foreign Exchange Rates (Broad Index), and Global Brent Crude and WTI Price, prices. numbers, charts, and graphs will be used to describe the discoveries made and be used to explain trends in these measures. This presentation will also cover the implications of these measures and how they relate to economic operations and outcomes.

BOARD 3A

MADDIE HOYT '26
BAILEY WEISE '25
BROOKE PARKER '25

KINEMATIC ANALYSIS OF LOWER EXTREMITY MOVEMENT PATTERNS DURING FUNCTIONAL TESTS IN COLLEGIATE TRACK AND FIELD RUNNERS TO PREDICT INJURY INCIDENCE

Faculty Mentors: Professor Andrew Busch
Department of Health & Human Kinetics

Lower extremity overuse injuries are becoming increasingly more prevalent in endurance-based running sports. The purpose of this study was to first examine kinematic and kinetic variables within distance runners and compare those with previous lower extremity injuries to those without reported injuries; and second to understand if such variables predicted future injuries sustained throughout a track season. Twenty-five distance runners from the Ohio Wesleyan University track and field team (men: n = 13, age = 20.38 +/- 1.04, women: n = 12, age = 19.92 +/- 1.08) participated in the study. Participants completed a preseason and postseason injury history questionnaire, and testing included the Y-Balance Test Lower Quarter (YBT-LQ), drop-jump test, horizontal jump test, and running gait observation. Inertial Measurement Units (IMU) were utilized to collect joint angles during the drop-jump and horizontal jump tests. YBT-LQ composite scores, ground reaction force data, joint angles while landing, jump distance, foot strike pattern, and foot position while running were recorded. Subjects who were injured during the season demonstrated significantly lower rate of power development ($p = 0.006$, $d = -0.81$, 95% CI [-335968.37, -65836.15]), and significantly more left knee valgus motion during the drop-jump test ($p = 0.034$, $d = 1.13$, 95% CI [0.60, 14.35]) compared to subjects that were not injured. Slower reaction times and left knee valgus motion was associated with greater likelihood of getting injured. Analyzing force production and landing mechanics could be a beneficial way to assess distance runners for future injury risk. Future research with larger sample sizes is encouraged to better understand the relationship between lower extremity movement patterns and injury risk.

BOARD 3B

NATALIA MOLOTIEVSKIY '25

GENOME-BASED IDENTIFICATION OF KERATIN-DEGRADING ENZYMES IN FEATHER-DEGRADING BACILLUS STRAINS

Faculty Mentors: Professor Andrea Suria &
Professor Laura Tuhela-Reuning
Department of Biological Sciences

Feathers are composed of structurally complex keratin, which is resistant to degradation. This is an environmental challenge in the poultry industry, which generates an estimated 8-9 metric tons of feathers per year. Microbial keratinases offer a promising biotechnological solution. While Bacillus strains are known for keratinolytic activity, the genetic basis remains underexplored. This study uses bioinformatics to investigate protease diversity in Bacillus strains isolated from bird feathers and previously shown to have high keratinolytic activity.

Genomic DNA from 14 Bacillus strains, including three control strains (B. lichenformis B138, PWD-1, and 89S), was sequenced using Illumina and Oxford Nanopore platforms. Hybrid genome assemblies were generated using Unicycler and annotated with Prokka. A curated list of known keratinase protein sequences from public databases was compiled to identify candidate keratinase genes using BLASTp. Hits were filtered based on a minimum of 40% identity and 60% query coverage to retain proteins with potential keratinolytic activity.

Genome analysis of the strains revealed a wide range of protease families associated with keratin degradation. All strains encoded multiple S8 family serine proteases, the best-known keratinolytic enzymes. Additional serine protease families were identified, including S16 (12 strains), S10 (3 strains), and S9 (2 strains). Metalloprotease families were also represented: M32 (all strains), M38 (13 strains), M4 (4 strains), M3 (2 strains), and M28 (1 strain). These families have been reported in the MEROPS database and previous studies as contributing to keratin degradation, either independently or in synergy with S8 proteases. Notably, the control strains PWD-1 and 89S shared the same key protein families (S8, S16, M32, and M38) but also contained unique hits from M4 (89S). The diversity of protease families identified supports a multi-enzyme model for keratin degradation in Bacillus strains.

BOARD 4A

WILLOW ROSSER '25

IMPACT OF LEGISLATIVE CONTEXT ON LGBTQ+ FAMILY FORMATION DECISION MAKING BY SEXUAL AND GENDER IDENTITY

Faculty Mentors: Professor Krystal Cashen
Department of Psychology

Discriminatory anti-LGBTQ+ legislation and changes in abortion access swept the United States in 2023 (ACLU, 2024); experiences of such discrimination vary across LGBTQ+ identity groups and have been correlated with differences in parenting desires and intentions (Riskind & Tornello, 2017). Research with current LGBTQ+ parent families found that these legislative changes impacted their parenting behaviors (Goldberg, 2023). This study aimed to build on this by examining how LGBTQ+ people in the United States were adjusting their plans for future parenthood and testing for group differences by sexual and gender identity. Participants (N=374, Mage=30.32) identified as LGBTQ+ and were not current parents. Data was collected using an online survey that measured parenting desires, intentions, and perceived impact of anti-LGBTQ+/anti-abortion legislation with Likert scale items. ANOVA and post hoc analyses revealed that cisgender men reported significantly lower impact of anti-LGBTQ+ legislation (M=1.87, SD=1.18) than binary trans (M=2.75, SD=1.44, p=.001) and nonbinary/gender nonconforming people (M=2.46, SD=1.37, p=.013), as well as significantly lower impact of anti-abortion legislation (M=1.47, SD=0.91) than cisgender women (M=2.31, SD=1.42, p=<.001) and nonbinary/gender nonconforming people (M=2.17, SD=1.52, p=.004). Independent samples t-tests revealed that plurisexual participants reported a higher impact of anti-abortion legislation (M=2.19, SD=1.45) than monosexual participants (M=1.75, SD=1.18), t(285.42)=-3.14, p=.002. Implications for understanding differences across sexual and gender identity groups will be discussed.

BOARD 4B

CLAIRE HAMMOND '26

DETERMINING THE EFFECTS OF EARLY ADOLESCENT STRESS ON ADULT C57BL/6J MICE

Faculty Mentors: Professor Chelsea Vadnie
Department of Psychology

Anxiety and mood disorders are highly prevalent and often diagnosed in late adolescence or early adulthood, with stress being a major risk factor. However, limited studies focus on the long-term neurological and behavioral effects of adolescent stress in mouse models. Past work indicates that adolescent stress may increase anxiety- and depressive-like behavior and alter the expression of GABAA receptor subunits in specific brain regions. In this study, we sought to determine if we could replicate work on the effects of adolescent stress on behavior and GABA receptor gene expression in adult mice. Male and female C57BL/6J mice were separated into stressed and unstressed groups (n = 7-8 of each sex). Stressed mice experienced 3 days of stressors (forced swim, restraint, and elevated platform stress) from postnatal day (PND) 25 to PND 27. Control mice remained undisturbed. We hypothesized that early adolescent stress would increase anxiety- and depressive-like behaviors in adult mice and alter GABAA receptor subunit expression in brain regions implicated in regulating psychiatric-related behaviors. Behavioral testing started during early adulthood at PND 60. We used the open field (OF) and elevated plus maze (EPM) as measures of anxiety-like behavior, along with assays for depressive-like behavior. Brain tissue was collected at PND 69. Adolescent stress increased anxiety-like behavior in adult mice in the OF as measured by decreased center entries and center time (*p<0.05). However, stress had no impact on EPM behaviors or measures of depressive-like behavior. Thus, stress during early adolescence increases some anxiety-like behaviors in adult C57BL/6J mice. Results so far show that early adolescent stress decreased GABAA3 receptor subunit expression in the medial prefrontal cortex (mPFC) (p<0.001). These findings, similar to previous findings, suggest that GABAergic signaling in the mPFC plays a significant role in increased anxiety-like behavior after early adolescent stress.

BOARD 5A

MCKENNA TUTTLE '25
KLEVIONE BROWN '28

CAUSES OF ATHLETIC TRAINER ATTRITION: A CRITICALLY APPRAISED TOPIC

Faculty Mentors: Professor Elizabeth Starns
Department of Health and Human Kinetics

Clinical Scenario: Athletic Training (AT) attrition has been a persistent issue within the profession for years1,2. By identifying the factors contributing to the attrition rates among Athletic Trainers, targeted interventions can be developed to decrease attrition within the profession.
Focused Clinical Question: What are the leading causes of AT attrition?
Search Strategy: An electronic search was conducted across multiple databases and AT pertinent journals using the key terms "athletic training" and "attrition." Inclusion criteria were: studies published between 2015 and 2025, subjects being certified athletic trainers in the USA, and a focus on athletic training attrition factors. 41 results met all inclusion criteria.
Evidence Quality Assessment: All articles included an unfiltered level of evidence3. This level of evidence was appropriate as no systematic reviews or meta-analyses on AT attrition factors have been published within the past five years. All articles passed the Oxford Center for Evidence Based Medicine validity and reliability critical appraisal checklists and articles with a level 3B evidence or higher were included5.
Summary of Key Findings: The 41 studies identified several key factors contributing to athletic training attrition, with two studies specifically focusing on athletic trainers who left the profession. Work-life balance and long hours were identified as stressors in thirty of the articles. Additionally, a lack of autonomy, job flexibility, family conflict, and guilt were commonly associated with the profession and reportedly major contributors to attrition. Burnout and role strain were closely linked, as well, with nearly half of the studies highlighting these issues.
Clinical Bottom Line: Overall, the findings indicate that multiple factors, including poor work-life balance, burnout, lack of autonomy and job flexibility, role strain, high number of hours worked, and work-family conflict or guilt contribute to feelings of dissatisfaction within the field of AT. Addressing these concerns is essential to reducing attrition rates.

BOARD 5B

BRITTNEY PARKS '27

THE EFFECTS OF MEAL SIZE AND FEEDING FREQUENCY ON DIGESTION IN COMMON WALL LIZARDS (PODARCIS MURALIS)

Faculty Mentors: Professor Eric Gangloff
Department of Biological Sciences

Understanding the interplay between feeding, energetics, and temperature in ectotherms is essential, particularly regarding introduced species and climate change. Despite its importance, how feeding regimes—including meal timing and size—affect digestion has been underexplored. Previous research suggests that digestion is thermally dependent, with warm temperatures promoting quick digestion, and that consuming smaller meals results in slower digestion. However, empirical evidence is limited. Our study quantified digestive passage time, energy budgets, and fecal and urate production in the introduced common wall lizard (Podarcis muralis) relative to meal size and timing under a naturalistic temperature cycle (warm days at 34℃ and cool nights at 25℃). We implemented four treatment groups based on meal size (large or small) and timing (morning only or morning and afternoon). While lizards consuming less foods took significantly longer to completely pass food items, energy budgets and fecal and urate production did not differ among treatments. Our findings suggest that feeding regime may have some influence on digestive processes, but not to the extent of regulating energetics in the common wall lizard. Consistent energy budgets, despite variable meal sizes and timing of food consumption in relation to temperature, may contribute to the wall lizard invasion success. Digestive processes play a critical role in regulating persistence, and results of this study highlight the importance of quantifying feeding regimes and natural temperature cycles, with implications for invasion biology and predicting responses to climate change.

BOARD 6A

MASON CAMPBELL '27

AMERICAN AND CUBAN DIETARY GUIDELINES

Faculty Mentors: **Professor Elizabeth Nix**
Department of Health and Human Kinetics

The culinary guidelines of the United States and Cuba reflect distinct cultural, historical, and geographical influences. They share commonalities because of their intertwined histories. American cuisine is characterized by its diversity, regional flavors, and innovation, with fast food and convenience foods emerging as defining features of modern food culture. In contrast, Cuban food is deeply rooted in the island's Afro-Caribbean and Spanish influences. By combining culture and nutritional adequacy, each of these countries has established its own food-based guidelines. While American food emphasizes convenience and fast-paced dining, Cuban food highlights family-style meals, often centered around communal eating and traditional cooking methods. Despite these differences, both countries have adapted their nutritional guidelines and cultural practices to their environment and nutritional needs. The Cuban diet represents America's ideal natural nutritional intake, emphasizing natural, balanced meals. Through our observations and research, we will compare the dietary guidelines of the American diet and the Cuban diet, as well as the dietary intakes of key foods and nutrients between residents.

BOARD 6B

HALEIGH STOVER '25

CHARACTERIZATION OF FREE-LIVING NEMATODES ISOLATED FROM OWU NATURE PRESERVES

Faculty Mentors: **Professor Danielle Hamill**
Department of Biological Sciences

Nematodes, or roundworms, are diverse and abundant animals found throughout the world and include both parasitic and free-living forms. Caenorhabditis elegans is a model organism that is the most intensely studied of the free-living nematodes. We are interested in learning more about other types of free-living nematodes. We recently collected five worms that were associated with millipedes in OWU's Kraus and Bohannan Nature Preserves. We are able to culture and grow the worms in the lab, and we are working to identify and characterize them. We extracted DNA and amplified conserved nuclear and mitochondrial genes by thermal cycling, which we then sent for DNA sequencing. Our DNA sequence analysis shows that we have two types of worms, both in the genus Oscheius. They are likely new isolates of worms that the Hamill lab has been characterizing and which, importantly, we believe represent two new and undescribed species. (See the poster by A. Gerhardt.) As little is known about these worms, we are characterizing their life cycle events at different temperatures, and we are investigating whether the worms are reproductively isolated from each other. This work is important for characterizing new species, and comparative studies like ours will help to better understand an important and diverse phylum of animals.

BOARD 7A

CHANTRY SIMON '26

MAPLE TREES: ENVIRONMENTAL AND GENETIC INFLUENCE ON SAP SWEETNESS

Faculty Mentors: **Professor Laurel Anderson**
Department of Biological Sciences

In this study, we looked at factors that potentially affect sap sweetness. It is important to know these factors that limit or enhance the sweetness of sugar maple sap for its ramifications in the maple syrup industry: especially in regards to climate change. Using a stand of 55 maple trees, we measured the sweetness, in brix, of the sap that flowed from them during the sugaring season -- between late January and the beginning of March--and compared it with the previous growing season's average temperature. We also compared the maple trees against each other to see if some trees produced a sweeter sap on average: this would suggest a genetic component.

BOARD 8A

MICHAEL OSTERTAG '25
CARSON GEIER '25
AIDAN FLOWERS '25
JOEY WISEMAN '25

INTERPRETING FINANCIAL SIGNALS TO BETTER UNDERSTAND THE MARKET

Faculty Mentors: **Professor Goran Skosples**
Department of Economics & Business

Stock market indices, consumer credit, 2 and 10 year treasury note yield, and money stock measures help provide insight to the health and performance of the US economy. Over the course of the 2025 Spring semester we analyzed the financial sector through these variables. This poster describes:
- the definitions of each variable that was analyzed.
- how variables are constructed and what they measure.
- the historical patterns for each variable · the usefulness of each variable to predict economic recessions.
- the behavior of each variable with respect to the economic theory.
- the limitations of using each variable to describe the state of the international sector.
- the forecasted value of each variable.

BOARD 8B

BRIELLE DECAROLIS '25

MALE MATING PREFERENCES OF SAILFIN MOLLIES (POECILIA LATIPINNA) FOR FAMILIAR AND NAIVE FEMALES

Faculty Mentor: Professor Shala Hankison
Department of Biological Sciences

Often, studies will look into female mating preferences, but understanding male mate preferences can give us a deeper understanding of how males can maximize their reproductive fitness in the wild. One area of interest involves how males display their mating preferences for either familiar or unfamiliar females. This study focused on that male mating preference in the sailfin molly Poecilia latipinna. Sailfin mollies, as they are live-bearing fish and have easily identifiable courtship displays, are used to model mate preference and choice. We hypothesized that males would preferentially mate with an unfamiliar female in order to maximize mating opportunities and increase reproductive fitness through genetic diversity. This study presents male preferences between familiar and unfamiliar females. During testing, the males were able to see/smell two females (one familiar and one unfamiliar) but could not actively mate. This test indicates which female he would preferentially mate with, if given the chance and will help us understand how male preferences influence overall reproduction in this species.

BOARD 9A

ROBERT ROSS '27
ANDREW CONSTABLE '26
HEATH MILLER '27
CONNOR MORGAN '27

MEASURING INFLATION: A COMPARATIVE LOOK AT CPI, PPI, AND PCE

Faculty Mentors: Professor Goran Skosples
Department of Economics & Business

Inflation remains a pivotal factor influencing economic decision-making for policymakers, businesses, and consumers. This group project provides a comparative analysis of key inflation measures: the Consumer Price Index (CPI), Producer Price Index (PPI), and Personal Consumption Expenditures (PCE) Price Index, alongside inflation expectations data from the Cleveland Fed. Each measure uses different calculation methods, weighting schemes, and data collection processes, providing different perspectives on inflation trends. Examining CPI, PPI, and PCE reveals each different measures strengths and limitations. CPI captures changes in out-of-pocket consumer expenses while PPI focuses on the production side cost variations. PCE, a measure favored by the Federal Reserve, encompasses a broader range of consumer spending. In addition, supplemental survey information from the Cleveland Fed shows how households and businesses anticipate future price trends. The data from the Cleveland Fed can help to provide an insight into inflationary trends. Our comparative approach demonstrates both the importance of considering multiple different measures of inflation and how these unique indicators, along with expectations data, can inform more strategic policy and business decisions.

BOARD 9B

ARIANA BROWN '26
BROOKLYN UPP '27
FIONA MINTON '25
DELLEN ROUSH '23

RED-BACKED RELATIONSHIPS: IT'S COMPLICATED

Faculty Mentors: Professor Eric Gangloff
Department of Biological Sciences

Eastern Red-Backed Salamanders (Plethodon cinereus) are widespread and common in forest habitats across the northeastern United States and southeastern Canada. They are small and fossorial (live underground), with the need to keep their bodies moist because they breathe through their skin. We examined how climate impacts different aspects of the Eastern Red-Backed Salamander's ecology, specifically social interactions and surface activity. To do this, we used co-occurrence and environmental data from our standardized cover board surveys at Kraus and Beltz Nature Preserves in Central Ohio. If salamanders were found within a typical home-range of each other (same or immediately adjacent coverboard), they were considered co-occurring. Using our environmental data, we found that the Eastern Red-Backed Salamanders were more active (1) at intermediate temperatures, (2) at higher humidity, and (3) in warmer soil. However, there was no relationship between surface activity and soil water content. In female-male co-occurrence pairs, we found the most variation in SVL difference; both positive and negative. Therefore, we hypothesized that larger males would prefer smaller females and we would see a negative relationship between male and female size. The results of our analysis indicated that there was no correlation in body size between co-occurring male and female salamanders. The sensitivity to its environment highlights the role of this salamander as an indicator species. Climate change will affect habitat availability, increase competition, impose physiological stress, alter social interactions, and potentially skew population demography. As research continues, we recommend population tracking for more time and across more areas, in addition to experiments measuring behavioral or physiological responses to predicted future change in environment.

BOARD 10A

PRISCILLA SANTOS '25

WHAT'S BUZZIN' AROUND CUBA?

Faculty Mentor: Professor Elizabeth Nix
Department of Health & Human Kinetics

Pollinators play a crucial role in ecosystems by supporting plant reproduction and maintaining biodiversity. In some countries, information about pollinators and their roles in food systems and usage of pollinator products is limited or inaccessible. Cuba is one such example. In spring 2025, I had an opportunity to observe farming practices and the importance of pollinators in Cuba during the travel portion of NUTR 300.12, where we visited around 6 different farms, 4 of them owned beehives that consisted of around 100 to 30 hives. I had the opportunity to speak with different farm owners, observe their colonies and products they produced. The use of pollinators for crops and harvesting bee products was first introduced to Cuba in 1764 by the Spanish who during this time were colonizing Cuba. In Cuba, there are 2 common bees used among organic farms; Melipona beecheii and Apis mellifera. The use of bees varies on different farms. Some farmers sell their honey to local stores, families or for self usage, whereas others are sold off to larger-scale markets, hotels, and other farmers. Cuba's regulatory environment differs from that of countries such as the US. Cuban farmers who own bee colonies and produce honey must receive governmental approval. This involves inspections to ensure the quality and type of honey that is being produced. Pollinators play a significant role in supporting sustainable farming in Cuba, contributing to the cultivation of essential crops such as coffee, tobacco, avocado, and fermented produce. Farmers heavily rely on insects in order to maintain crop yields and meet production quotas, which highlights the importance of pollinators in Cuba's agricultural landscape.

BOARD 10B

PAYTON BOERNER '25
MUKTA ASHTIKAR '26
NATHAN COMBS '26
TYLER CUNNINGHAM '25

BUSINESS 1 SECTOR FUTURE OUTLOOK

Faculty Mentors: Professor Goran Skosples
Department of Economics & Business

Our project explores four key indicators : Capacity Utilization, Construction Spending, Durable Goods Orders, and Industrial Production. They will assess the U.S. manufacturing and construction sectors. Through three newsletters and a final poster, each team member tracked one variable, analyzing its meaning, measurement, historical trends, and forecasts. We evaluated how well each variable reflects sector health, how they relate to economic cycles, and how they align with macroeconomic theory. Our findings offer insights into current economic conditions and potential implications for monetary policy.

BOARD 7B

GARRETT SMITH '26
AIDEN WIGHTMAN '26

USING VEHICLE SALES AND MANUFACTURING PMI TO DESCRIBE THE BUSINESS II SECTOR

Faculty Mentors: Professor Goran Skosples
Department of Economics & Business

Our Spring Symposium project analyzes how Vehicle Sales and the Manufacturing Purchasing Manager Index (PMI) reflect trends within the Business II sector and the broader U.S. economy. By examining these key indicators, vehicle sales as a measure of consumer demand and durable goods output, and the Manufacturing PMI as a gauge of production momentum and supply chain health, we aim to understand how shifts in these metrics signal economic expansion or contraction.

Since January 2025, we have tracked these indicators monthly and published newsletters for January, February, and March. Our newsletters interpret changes in the data, highlight notable trends, and connect those insights to real-world economic developments. For instance, a dip in vehicle sales alongside a contractionary PMI might indicate weakening industrial output and consumer sentiment, while simultaneous increases in both metrics could signal economic recovery or growth.

Our presentation will showcase these monthly trends and explore how vehicle sales and PMI are early indicators for business cycle changes. We also assess their historical reliability and discuss the potential limitations of relying solely on these indicators in economic forecasting. Ultimately, our goal is to provide a concise, data-driven perspective on how sector-specific indicators can offer valuable insight into the health of the overall economy.

ORAL PRESENTATION - 4:30 - 4:50 PM

EMILY CLAUSING '25, MAJA TODOROVIĆ '25, PARKER OLUKALNS '28 HOLLY ROBINSON '26, SHANNON BARR '27, HALEIGH STOVER '25, ABIGAIL BENNETT '26, JACK MILLER '26, JAYSON DYER '27, JUDY RAY '27, KATIE DAVIS '26, KAYA FERRELL '26, LIZ RAILSBACK '27, LUCY RANKIN '27, RAPHAEL PETIT-FRERE '25, & SAM BUC '26

CHORAL MUSIC OF CENTRAL ITALY AND THE VATICAN

Faculty Mentors: **Professor Jason Hiester**
Department of Performing Arts

In late 2024 and early 2025, the Ohio Wesleyan University Choral Art Ensemble, under the direction of Professor Jason Hiester, embarked on a tour of Italy, performing in Rome, Matera, and Gesualdo. This vocal group, renowned for its high level of musicality and diverse repertoire, comprises students from various academic disciplines who perform both classical and contemporary choral works.

The ensemble's Italian tour featured several notable performances. On January 3, 2025, they participated in the "Coralmente Matera... a Natale" festival in Matera, performing alongside local choirs such as the Coro della Polifonica Materana Pierluigi da Palestrina and Polifonica Totus Tuus at the Church of San Francesco d'Assisi.

Prior to their Matera performance, the ensemble held a concert on December 30, 2024, at the historic Castello di Gesualdo. This event was highlighted by local media, emphasizing the prestige of hosting the Ohio Wesleyan University Choral Art Ensemble in such a significant venue.

The ensemble's tour reflects Ohio Wesleyan University's commitment to offering students global learning experiences through the OWU Connection travel learning program. The Choir, a select ensemble of 20-26 members with a focus on Renaissance, Baroque, and modern music, has a tradition of touring Italy every 2-3 years as part of this initiative.

Through these performances, the Ohio Wesleyan University Choral Art Ensemble not only showcased their musical talents but also engaged in cultural exchange, enriching both the performers and their audiences in Italy.

ORAL PRESENTATION - 4:50 - 5:10 PM

AMARILYS TORRES-NUNEZ '25

DIASPORIC AUTHENTICITIES: MIGRATION, MEMORY, AND THE SHAPING OF CUBAN AND PUERTO RICAN IDENTITIES

Faculty Mentors: **Professor Chris Fink**
Department of Health and Human Kinetics

Transnational migration has profoundly shaped national identity and influenced cultural authenticity debates among Cubans and Puerto Ricans, both on the island and in the diaspora. While migration is often framed as a departure from one's homeland and cultural identity, diasporic communities actively engage in cultural preservation and transformation, often raising the question of who is authentically 'Puerto Rican" and "Cuban." This study examines how migration influences national identity formation and cultural gatekeeping within Puerto Rican and Cuban communities by analyzing historical migration patterns, political influences, and diasporic cultural practices.

Drawing on diaspora studies, post-colonial theory, and Bourdieu's concept of cultural capital, this research explores how identity is fluid rather than fixed, continuously shaped by migration, historical memory, and sociopolitical contexts. Key areas of analysis include the contrasting perspectives of those currently living on the islands with diasporic communities in the U.S on cultural legitimacy, and the significance of cultural traditions such as music, food, and language in maintaining connections to the homeland.

By comparing these experiences, this study highlights the ways by which migration complicates traditional notions of national identity. Challenging the assumption that diasporic identities are diluted or less "authentic" than those on the island and argues that cultural expression in the diaspora is equally valid and essential to broader understandings of Cuban and Puerto Rican identity. This research contributes to discussions on transnational belonging, the impact of colonial histories on cultural identity, and the evolving nature of authenticity in diasporic communities.

ORAL PRESENTATION - 5:10 - 5:30 PM

GRACE FRYE '25

CULTURAL SYMBOLS AND SOCIAL NORMS: A STUDY OF MARRIAGE IN RURAL NEPAL

Faculty Mentor: Lisa Ho
Office of International and Off-Campus Programs

Marriage cultures, expectations, and traditions differ widely across the globe. To explore the personal experiences of women within their marriages, I spent a month in a small village in Nepal, engaging with women whose maternal, paternal, or both sides of the family reside in the village. Through interviews and observations, including attending tow weddings, I gained insight into the symbolic makers of marriage, such as red tiki, red bangles, and pote beads, which women wear daily. The village, home to a single caste, provided a unique context in which to examine shared experiences and stories. I argue that a woman's relationship with both her maternal and husband's homes is shaped by the people who reside there, infusing her perceptions of both. While the women's lived experience within their marriages are diverse, they all face common challenges within the framework of a patriarchal society.

ORAL PRESENTATION - 4:30 - 4:50 PM

NICO MAZZOLENI '25

LOST IN TRANSLATION: PUBLIC SIGNAGE, LINGUISTIC EXCLUSION, AND COMMUNITY IDENTITY IN LITTLE VILLAGE, CHICAGO

Faculty Mentors: Professor Vanessa Hildebrand
Department of Sociology & Anthropology

Chicago is often celebrated for its cultural diversity, yet it remains one of the most segregated cities in the world. This research examines the disconnect between the overwhelmingly Mexican identity of Little Village ("La Villita") and the linguistic landscape of its public signage. Despite 81% of residents identifying as Latine and 75% as Mexican or Mexican American, public signs—including business fronts, street markers, warnings, and informational resources—are predominantly in English or establishing English as the dominant language. This study investigates how this linguistic exclusion impacts residents' access to resources, sense of belonging, and community identity.

Using a mixed-methods approach, I conducted visual data gathering through observation and photography, alongside unstructured interviews with long-term residents and workers in Little Village. The findings confirm that the linguistic composition of public signage does not accurately reflect the neighborhood's demographics. This lack of representation restricts access to critical information, including safety precautions and public resources, reinforcing systematic marginalization. Furthermore, it raises broader concerns about cultural preservation and the role of language in fostering inclusivity within urban spaces.

This research highlights the vital role of multilingual signage in ensuring equitable access and representation for non-English-speaking communities. By framing public signage as both a practical necessity and a tool for cultural affirmation, the study challenges the notion that linguistic accessibility is a privilege rather than a right. The findings contribute to ongoing discussions on immigrant representation and urban policy, providing a framework for future analyses of linguistic landscapes in other ethnically diverse neighborhoods. Ultimately, multilingual signage is not just a convenience but an essential component of social justice, allowing Latine communities to resist forced assimilation and maintain their cultural identity within the U.S.

ORAL PRESENTATION - 4:50 - 5:10 PM

CLARA WOOD '25

CRAFTING JUSTICE: A HISTORY OF CRAFT AND RESISTANCE

Faculty Mentors: Professor Camilla Querin
Department of Fine Arts

"I do not want art for a few, any more than education for a few, or freedom for a few," states William Morris, artist and activist whose words proclaim the intertwined relationship between the act of craft and social activism. The Arts and Crafts movement of the 19th and 20th centuries in Europe and North America, largely inspired and influenced by the philosophy of Morris, blossomed as a response to rapid industrialization, emphasizing care towards hand crafted objects and the democratization of art as a means to build connected and sustainable communities. In the 21st century, craftivism empowers individuals to express their dissidence and political stance through creative expression and the act of making. From William Morris to the craftivists of today, handcraft has always been political, whether the object created is political or not. This paper explores the use of fiber arts by collectives including the NAMES Project Quilt and the Pussyhat Project as an outlet for activism and dissent, and demonstrates how the act of craft itself is an antidote to industrialism and an innate form of resistance.

ORAL PRESENTATION - 5:10 - 5:30 PM

MAIZY PRATT '25

BACTERIAL GENOME CHARACTERIZATION FOR THE PRODUCTION OF TASTE AND ODOR COMPOUNDS IN DRINKING WATER RESERVOIRS: A MULTIFACETED APPROACH

Faculty Mentor: Professor Andrea Suria
Department of Biological Sciences

A wide variety of bacteria, namely the classes Actinomycetia and Cyanobacteria, are known to produce the taste and odor (TO) compounds geosmin and 2-methylisoborneol (MIB). These compounds pose an aesthetic dilemma in drinking water despite their lack of toxicity to humans. This study investigates the relationship between the presence of benthic bacteria, geosmin, and MIB in Ohioan drinking water reservoirs on the Del-Co Water Company campus, revealing the potential for bacteria outside the aforementioned classes to produce these TO compounds. From August to November of 2024, viable counts were compared to tested levels of geosmin and MIB, revealing a statistically significant relationship between colony-forming units (CFUs) and the TO compounds in question. To further explore this relationship, the genomes of three benthic isolates from Del-Co reservoirs were sequenced and analyzed for genetic infrastructure encoding possible TO compound-producing proteins. These isolates are predicted not to produce geosmin or MIB, but the genomes were further annotated and characterized.

AUBREY GERHARDT '25

CLARINET CONCERTO PERFORMANCE WITH THE OWU SYMPHONIC WIND ENSEMBLE

Faculty Mentor: Professor Richard Edwards
Department of Performing Arts

Senior Music Major Performance : Concert at 8 pm in Gray Chapel

Satoshi Yagisawa (b. 1975) is a Japanese composer who writes a variety of music, including orchestral, chamber, and choral works. Yagisawa's Clarinet Concerto was commissioned by the Higashi-Hiroshima Wind Ensemble and was premiered by clarinetist Shinsuke Hashimoto. The concerto is similar to, yet departs from, conventional 18th and 19th-century concerto form. It consists of three movements, beginning with an introduction that leads into the first movement's vigorous melodic ideas and features interplay between the clarinet and ensemble. This is followed by a slow intermezzo with sweet flowing melodies in the clarinet that are reflected by the upper woodwinds. The final movement toys with a recurring motive while bringing back a variety of melodic ideas from the first movement. The concerto concludes with extremely lively, upward sweeping gestures in the coda. This concerto features the soloist in multiple virtuosic cadenzas and showcases the clarinet's technical capabilities.

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