UF IFAS UNIVERSITY of FLORIDA

SCHOOL OF NATURAL RESOURCES AND ENVIRONMENT

School of Natural Resources and Environment

2023 SNRE Research Symposium

April 4, 2023 | J. Wayne Reitz Union Grand Ballroom

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Welcome to the 2023 SNRE Research Symposium

Welcome to the 2023 Research Symposium sponsored by the School of Natural Resources and Environment (SNRE), Institute of Food and Agricultural Sciences (IFAS), and the University of Florida (UF). The objectives of this inaugural Research Symposium are to: 1) provide graduate and undergraduate students a framework to showcase their interdisciplinary research in ecology, environment, and sustainability, and 2) enhance the interaction among students and faculty with participants from various groups.

SNRE operates horizontally across UF's elaborate structure of academic disciplines and is built on existing strengths in the University by partnering with academic departments and interdisciplinary research centers and institutes. Approximately 340 members of the UF faculty in 50+ departments of 12 colleges are formally affiliated with SNRE. In addition, SNRE graduate students conduct their research with faculty affiliated with or physically located at 20+ interdisciplinary research centers and institutes. SNRE offers university-wide degree programs, including the B.A./B.S. in Environmental Science and the M.S. and Ph.D. in Interdisciplinary Ecology.

It is the goal of SNRE to produce highly trained scientists, social scientists, engineers, and other professionals who increase our ability to achieve economic, environmental, and social sustainability for future generations. SNRE's strategy is to provide an educational process that develops an environmentally literate citizenry and enables the public to integrate natural resources and the environment into national security, economic development, and the overall quality of life.

The keynote speaker for this year's Research Symposium is Dr. Robert D. Holt, Eminent Scholar and Arthur R. Marshall, Jr., Chair in Ecological Studies, Department of Biology, UF. His presentation is entitled "SARS-CoV-2 Meets the Ecological Niche." Dr. Holt's biographical information appears on page 4 of this program.

Research conducted by graduate and undergraduate students is the core of SNRE. At present SNRE has 120 graduate and 200 undergraduates. For this inaugural Symposium, we offer select examples of the research conducted by undergraduate and graduate students supported by SNRE affiliate faculty members on topics related to ecology and environmental sciences. Student presentations include six oral and 47 poster presentations.

For additional information about SNRE academic programs, please contact Dr. K. Ramesh Reddy at krr@ufl.edu or call our office at 352-392-9230.

Symposium Agenda

April 4, 2023 | J. Wayne Reitz Union Grand Ballroom

8:00 am – 9:00 am ..... ***Registration***

9:10 am – 9:20 am..... ***Introduction***
Dr. K. Ramesh Reddy, Director, School of Natural Resources and Environment

9:20 am – 9:30 am ..... ***Opening Remarks***
Dr. Scott Angle, Senior Vice President for Agriculture and Natural Resources, UF/IFAS

9:30 am – 9:35 am ..... ***Introduction of Keynote Speaker***
Dr. Bette Loiselle, SNRE Faculty Advisory Council Chair

9:35 am – 10:30 am ..... ***Keynote Address: 'SARS-CoV-2 Meets the Ecological Niche'***
Dr. Robert D. Holt, Eminent Scholar and Arthur R. Marshall, Jr.,
Chair in Ecological Studies, Biology Department, University of Florida

10:30 am – 10:50 am..... **Break**

SESSION I – Faculty Oral Presentations

Session Chair: ..... **Dr. Alison Adams**, Assistant Professor, Forest, Fisheries and Geomatic Sciences

10:50 am – 11:05 am ..... **Dr. Miguel Acevedo**, Assistant Professor, Wildlife Ecology and Conservation

11:05 am – 11:20 am..... **Dr. Jessica Kahler**, Assistant Professor, Sociology

11:20 am – 11: 35 am ..... **Dr. Mysha Clarke**, Assistant Professor, Forest, Fisheries, and Geomatic Sciences

11:35 am – 11: 50 am ..... **Dr. Jiangxiao Qiu**, Assistant Professor, Forest, Fisheries and Geomatic Sciences,
Ft. Lauderdale Research and Education Center

11:50 pm – 1:00 pm..... **Lunch Break**

SESSION II - Student Oral Presentations

1:00 pm – 1:10 pm ..... ***Introductory Remarks***
Dr. Elaine Turner, Dean, College of Agricultural and Life Sciences, UF/IFAS

Session Chairs: ..... **Orlando Acevedo-Charry** and **Jenna Reimer**

1:10 pm – 1:25 pm ..... **Emily Pappo** (Advisors: Dr. Luke Flory and Dr. Chris Wilson)

1:25 pm – 1:40 pm ..... **Diana Perry** (Advisor: Dr. Ed Camp)

1:40 pm – 1:55 pm ..... **Trista Brophy Cerquera** (Advisors: Dr. Sam Smidt and Dr. Eban Bean)

1:55 pm – 2:10 pm..... **Maggie Jones** (Advisors: Dr. Rob Fletcher and Dr. Bob McCleery)

2:10 pm – 2:25 pm..... **Owen Schneider** (Advisor: Dr. Ben Baiser)

2:25 pm – 2:40 pm..... **Angela Melidosian** (Advisor: Dr. Les Thiele)

2:40 pm – 3:00 pm ..... **Break**

SESSION III - Student Poster Sessions

3:00 – 4:00 pm..... **Poster Session I**
Students present odd-numbered posters during this time.

4:00 – 5:00 pm..... **Poster Session II**
Students present even-numbered posters during this time.

Keynote Speaker

Dr. Robert D. Holt

Eminent Scholar and Arthur R. Marshall, Jr.
Chair in Ecological Studies, Biology Department, University of Florida

Robert D. Holt is an ecologist particularly known for theoretical and conceptual contributions to population and community ecology, and for fostering the integration of ecology with evolutionary biology. His research examines how species interact, both directly and indirectly, in complex webs. He addresses the ecological and evolutionary consequences of such interactions, and how such interactions unfold across space, contributing for instance to geographical range limits. Dr. Holt was born and raised in Tennessee. He graduated from Princeton in 1973 with a degree in physics, but fortunately each semester took an upper-level course in biology just for fun. This allowed him to pursue graduate studies in biology at Harvard, where he received his doctorate in 1979. He then moved to the University of Kansas, where he was on the faculty and a curator in the Museum of Natural History. In 2001, he shifted to the University of Florida to accept the titles of Eminent Scholar and Arthur R. Marshal Jr. Chair in Ecological Studies. He is a Fellow of the American Academy of Arts and Sciences as well as the National Academy of Sciences, and has been president of the American Society of Naturalists. In 2022, he was elected as member of the National Academy of Sciences, joining the ranks of leading scientists recognized for their life-time accomplishments in research. He is a keen naturalist and has participated in expeditions to many remote corners of the globe.

Dr. Holt's lab utilizes a variety of theoretical approaches, ranging from the use of relatively simple models to explore common but complex ecological phenomena to detail-rich, spatially explicit individual-based models. The lab also takes empirical approaches to ecological questions, including the implementation and analysis of landscape experiments. Specific topics at present in the lab span a diverse array of themes in ecology and evolutionary biology. Ecological topics include: integrating community ecology perspectives into traditional arenas of evolutionary ecology (e.g., the evolution of aposematism and mimicry); indirect interactions in multispecies communities; exploring how resources and predation drive infectious disease dynamics and impacts in ecological communities; and litter as a mechanism of interference competition and ecosystem engineering in plant communities. Evolutionary topics include analyses of genetic, phenotypic and ecological influences on evolutionary rescue (when natural selection permits a species to adapt to a novel environment, where otherwise it would go extinct) and niche conservatism (e.g., constraints on evolution at the edge of geographical ranges, and in sink habitats). Though his research is largely theoretical and conceptual, he has also engaged in field work, for instance setting up a large-scale experiment in Kansas on how habitat fragmentation modulates secondary succession (among the longest-running field experiments in ecology).

Invited Speakers

Dr. J. Scott Angle

Senior Vice President for Agriculture and Natural Resources, UF/IFAS

Dr. J. Scott Angle is a national leader in developing the science that supports food production and management of natural resources. As chief executive of the agriculture and environmental sciences arm of a leading land-grant university, he champions public science as a path to improve lives and reduce human suffering.

His accomplished career in government, nonprofit international development, and academia informs an approach to leadership based on service, partnership, and drive for impact. An innovator who holds seven patents, Dr. Angle has successfully guided multiple organizations through budget shortfalls and other challenges.

Dr. Angle leads nearly 2,300 employees who work in all 67 Florida counties. UF/IFAS encompasses the College of Agricultural and Life Sciences, the Florida Cooperative Extension Service, and the Florida Agricultural Experiment Station.

Dr. Angle took the helm at UF/IFAS in July 2020, fresh from his position at the United States Department of Agriculture's National Institute of Food and Agriculture (NIFA). As director of NIFA, he led federal support for the science underpinning the success of American agriculture, frequently partnering with land-grant universities. Prior to his national service, he led the non-profit International Fertilizer Development Center (IFDC), where he oversaw a staff of more than 800 and coordinated development projects worldwide.

From 2005 to 2015, he served as Dean of the College of Agricultural and Environmental Sciences at the University of Georgia. During his tenure, the college's enrollment grew 30 percent. He consolidated the college's farms and land holdings to create more cohesive research facilities. He also fostered greater diversity and inclusion, creating an assistant dean of diversity position, and appointing the first and second female associate deans in the college's history and the first female academic department head.

Dr. Angle worked as professor of soil science at the University of Maryland and later as director of the Maryland Agricultural Experiment Station and Maryland Cooperative Extension. He is widely cited for his scholarship on phytoremediation, the use of plants for extraction of heavy metals from soil. Angle received his B.S. in agronomy and M.S. in soil science at the University of Maryland. He earned his Ph.D. from the University of Missouri with an emphasis on soil microbiology. He is a Fellow of the American Association for the Advancement of Science.

Dr. R. Elaine Turner

Dean, College of Agricultural and Life Sciences, UF/IFAS

Dr. R. Elaine Turner serves as Dean of the College of Agricultural and Life Sciences (CALS) at the University of Florida (UF) providing leadership for academic programs across the 16 departments and schools that comprise UF's Institute of Food and Agricultural Sciences. CALS enrolls nearly 7,000 students in 23 undergraduate and 23 graduate majors, and more than 40 certificate programs. Dr. Turner holds a faculty appointment as Professor in the Food Science and Human Nutrition Department.

She has been recognized by the UF College of Agricultural and Life Sciences as both Undergraduate Teacher of the Year (2000-2001) and Undergraduate Advisor of the Year (2002-2003) and was named one of two UF Honors Professors of the Year in 2003. In 2004, Dr. Turner received the National Award for Excellence in College and University Teaching in the Food and Agricultural Sciences from USDA.

She has served in leadership roles with the Association of Southern Academic Programs, was elected to serve two terms on the Association of Public Land-grant Universities Board on Agriculture Assembly's Policy Board of Directors, and currently serves on the Agriculture Future of America Board of Directors.

Dr. Turner earned her undergraduate degree in dietetics from Kansas State University and M.S. and Ph.D. degrees in nutrition from Purdue University.

Affiliate Faculty Presentations

Dr. Miguel Acevedo

Assistant Professor, Wildlife Ecology and Conservation

Stumbling With the 'Medici Effect': Adventures at the Intersection of Biological Conservation and Industrial Engineering

What is interdisciplinary ecology? How do interdisciplinary teams work in practice? What are the challenges and rewards of working in interdisciplinary teams? In this presentation I share anecdotes and lessons from my quest as an SNRE alumnus collaborating with industrial and systems engineers to answer one of the oldest questions in conservation planning: if we have a limited amount of resources to design a network of protected areas, what should we prioritize? We solve this issue by applying network interdiction models commonly used in military applications. At the end of the talk, I hope to make my case for the need of more and better interdisciplinary collaborations and synthesize lessons and best practices.

Dr. Mysha Clarke

Assistant Professor, Forest, Fisheries, and Geomatic Sciences

Human Dimensions of Forest Management: Disturbances and Human Decision-Making Along the Urban-Rural Gradient

Human dimensions of natural resources provide an invaluable lens to implement applied and interdisciplinary natural resources management. The goals of this presentation are to highlight the various applications of human dimensions research related to 1) invasive plant management on family forest lands, 2) forest restoration and social resilience after hurricane events, and 3) urban forest management in light of storm related disturbances and 4) overall urban forest stewardship. This talk will present some lessons learned from various projects related to human decision-making, perceptions, attitudes, and behaviors related to forest management in light in of increasing ecological disturbances and changing socio-ecological conditions in the urban-rural gradient.

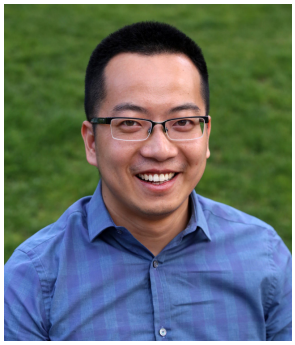
Affiliate Faculty Presentations

Dr. Jessica Kahler

Assistant Professor, Sociology and Criminology & Law

Necessarily Interdisciplinary: Deciphering Drivers of Wildlife Poaching and Protection Using Conservation Criminology

Conservation criminology is an interdisciplinary framework that draws from theories and methods in criminology, natural resource management, and risk and decision sciences. Understanding human behaviors as they relate to conservation, compliance, and protection requires understanding complex interactions between ecological, economic, regulatory, and socio-cultural systems. In this presentation, I will start with a brief discussion on the diversity of theories and methods employed. Further, I will provide an overview of findings from this interdisciplinary approach related to how human-wildlife interactions, economics, cultural, biological and ecological factors shape motivations, wildlife species vulnerability, and special patterns of wildlife poaching. Additionally, I will touch on leveraging criminological theory to understand pro-social community responses when witnessing wildlife crime. Lastly, I will discuss how interdisciplinary collaborations are helping to elaborate a conceptual framework to provide further insights on the implications of climate change on wildlife crime.



Dr. Jiangxiao Qiu

Assistant Professor, Forest, Fisheries and Geomatic Sciences, Fort Lauderdale Research and Education Center

Scaling Up Urban Agriculture as a Transformative Change to Advance Social-Ecological Resilience and Sustainability

Building and maintaining sustainable urban systems is a grand societal challenge of the 21st century, and requires resilience thinking and inter- and trans-disciplinary collaborations. Urban agriculture (broadly defined as growing, processing, and distribution of food products in and around cities) has potential to be a key lever for inducing transformative change in meeting this challenge. In particular, scaling up of urban agriculture holds promise in contributing to food security, mitigating environmental degradation, and providing vital urban ecosystem services. However, current understanding of drivers, processes, and pathways of scaling up urban agriculture remains fragmentary and largely confined to disparate disciplines and sectors. In this presentation, I will demonstrate how interdisciplinary ecology contributes to improved understanding of urban agriculture. I will draw multiple disciplinary domains to present an integrated conceptual model of urban agriculture, and reveal its social-ecological effects across scales. In addition, I will demonstrate multi-phase developmental pathways, including dynamics, accelerators, and feedbacks, to scale up urban agriculture, along with a practical modeling framework that can be used to test and investigate these dynamics and pathways. Finally, I will conclude with several key considerations for scaling up urban agriculture. This work presents a transdisciplinary roadmap for policy, planning, and collaborative engagement to scale up urban agriculture as a transformative change for achieving urban resilience and sustainability goals.

Student Oral Presentations

Trista Brophy Cerquera, Ph.D. student
Advisors: Dr. Sam Smidt, Soil, Water, and Ecosystem Sciences and Dr. Eban Bean, Agricultural and Biological Engineering

Progressing Community Resilience Through Geospatial Data and Tools: Applications for Water Quality and Quantity

Improperly managed stormwater leads to both increased flooding and degraded water quality as water is rapidly routed throughout a watershed and pollutants are accumulated. Stormwater management should then serve to reduce the social vulnerabilities to flooding and mititate the harmful impacts of poor water quality. Earth observation (EO) data, a type of geospatial data derived from satellites, aircraft, and in-situ measuring, are useful for stormwater and flood management decision-making and have continued to improve with technological advancements. However, the approaches for accessing, utilizing, and integrating these data can be highly varied across management entities. The purpose of my dissertation work is to determine the spatial and temporal analysis capabilities of publicly available EO data for stormwater management applications and to identify some of the limitations that government and non-profit organizations might face when determining if they can use remotely sensed Earth Observation data for their resiliency planning efforts.

Maggie Jones, Ph.D. student
Advisors: Dr. Rob Fletcher and Dr. Bob McCleery, Wildlife Ecology and Conservation

Demographic Responses of Savanna Trees to Changes in Herbivory

In many African savannas today, large mammalian herbivores are either declining from habitat loss and overhunting or require management interventions to control rapid growth, potentially altering these ecosystems. For example, the loss of large trees has raised concerns over the effects of increasing herbivore populations on the persistence of savanna tree populations. Using three years of demographic data collected within herbivore exclosures in Kruger National Park, South Africa, we assess how variation in herbivory affects survival and recruitment of three common savanna tree species. We found that megaherbivores (African elephants and giraffes) had unique demographic effects, generally reducing survival and facilitating recruitment. However, the effects of large mammalian herbivores varied across tree species, suggesting complex impacts at both the population and community level. Isolating these demographic responses allows for predictions about the future of savanna tree populations under different herbivory scenarios, which could inform savanna management under shifting herbifore regimes.

Angela Melidosian, Ph.D. student
Advisor: Dr. Les Thiele, Political Science

Transitions Toward Sustainability: Transforming Undergraduates' Key Sustainability Competence

The 21st century has seen tremendous human development and ingenuity. Yet growth in population, ecological degradation, inequality, and socioenvironmental risk raise concerns about the sustainability of our civilization—the ability to meet present needs without compromising future generations' ability to meet their needs. Education for Sustainable Development develops the requisite sustainability knowledge, skills, values, and attitudes for living sustainably and advocating for sustainability. Higher education is uniquely positioned to provide this education, preparing professionals of all disciplines to address sustainability challenges. Our research explores the potential for combining transformative learning and competency-based education to transform college learners' worldviews and develop their capacity to address global sustainability challenges. We pilot an undergraduate transformative sustainability learning course and novel assessment techniques to measure student competence and transformation. With this research, educators can learn to implement transformative learning and competency-based education to best equip students for careers as sustainability professionals.

Student Oral Presentations

Emily Pappo, Ph.D. student
Advisors: Dr. Luke Flory and Dr. Chris Wilson, Agronomy

Evaluating Climate Resilience of Arabica Coffee (Coffea Arabica) Agroecosystems
Climate change is causing increasingly severe challenges for global agriculture, which could have critical implications for food supplies, agricultural communities, and ecosystems. To respond to and withstand these shifting climate conditions, it will be increasingly necessary that agroecosystems demonstrate the capacity for resilience. My interdisciplinary ecology research in arabica coffee agroecosystems improves our understanding of how anthropogenic climate change may impact agroecosystem resilience and informs potential solutions for building resilience in these systems.

Diana Perry, Ph.D. student
Advisors: Dr. Ed Camp, Forest, Fisheries, and Geomatics Sciences

Integrating Management Objectives Into Stocking Optimization
Stock-enhanced freshwater recreation fisheries require the efficient use of hatcheries to address ecosystem needs and stakeholder preferences. Due to limited hatchery space each rearing season, managers must balance diverse stakeholder preferences, ecological needs, and hatchery constraints appropriately to successfully develop and maintain recreational fisheries. Efficiently delegating space in the hatchery can be optimized by addressing it as a knapsack problem—a combinatorial optimization problem that solves for the highest value attainable given a combination of weights and values of the possible stocking options within hatchery constraints. We collaborated with Florida Fish and Wildlife Conservation Commission personnel and stakeholders to identify weights based on stocking option rearing space and values based on management preferences. This optimization illustrates the impact of and sensitivity to balancing different types of manager and stakeholder preferences. This optimization can increase transparent communication between fisheries and hatchery managers and contribute to increasingly informed hatchery decisions.

Owen Schneider, Ph.D. student
Advisor: Dr. Ben Baiser, Wildlife Ecology and Conservation

Two Decades of Fire and Water Management Along a Rare Elevational Gradient in Everglades National Park
Quantifying the response of plant diversity to large-scale restoration is essential for measuring management success. One of the world's largest restoration efforts began in 2000 in Everglades National Park (ENP) through the Comprehensive Everglades Restoration Plan (CERP). This effort, in coordination with ongoing fire management, aims to restore natural hydrologic and fire regimes in this dynamic ecosystem. Fire and water regimes interact along an elevational gradient between seasonally inundated marl prairie and frequently burned pine rockland in Long Pine Key (LPK) in ENP. To determine the effects of management on plant community richness and composition we resampled transects spanning the elevational gradient between marl prairie and pine rockland originally sampled prior to the implementation of current restoration efforts. We failed to detect any systematic shifts in plant composition in response to updated fire and water management but found that complex interactions between fire and water structure plant composition along the elevational gradient.

Student Poster Presentations

Orlando Acevedo-Charry, Ph.D. student (Advisor: Dr. Miguel Acevedo) Poster #1

Bird Niche Responses to Global Environmental Change at Different Scales

The overall objective of my dissertation is to understand functionally mediated bird species responses to abiotic and biotic filters at different scales in the context of global environmental change. First, I will test the potential interactive role of temperature, interspecific associations, and dispersal ability as mediators of site occupancy, colonization, and extinction dynamics in tropical terrestrial bird ranges at a global scale. Then, I will test whether land bird populations on oceanic islands show niche expansion or shifts, as predicted if they are undergoing ecological release. These two objectives address environmental niche dynamics at larger scales using distributional ranges, but global environmental changes also influence population dynamics, community assembly, and individual behavior or relationship with natural enemies at smaller scales. In my third objective, I will substitute space for time to test the crucial role of abiotic, biotic, and functional traits mediating bird territories (vertical niche), patterns of diversity, and biotic interactions (species associations and prevalence of haemoparasites) in a local temperature gradient of northern Amazonia.

Hernan Alvarez, Ph.D. student (Advisor: Dr. Jessica Kahler) Poster #2

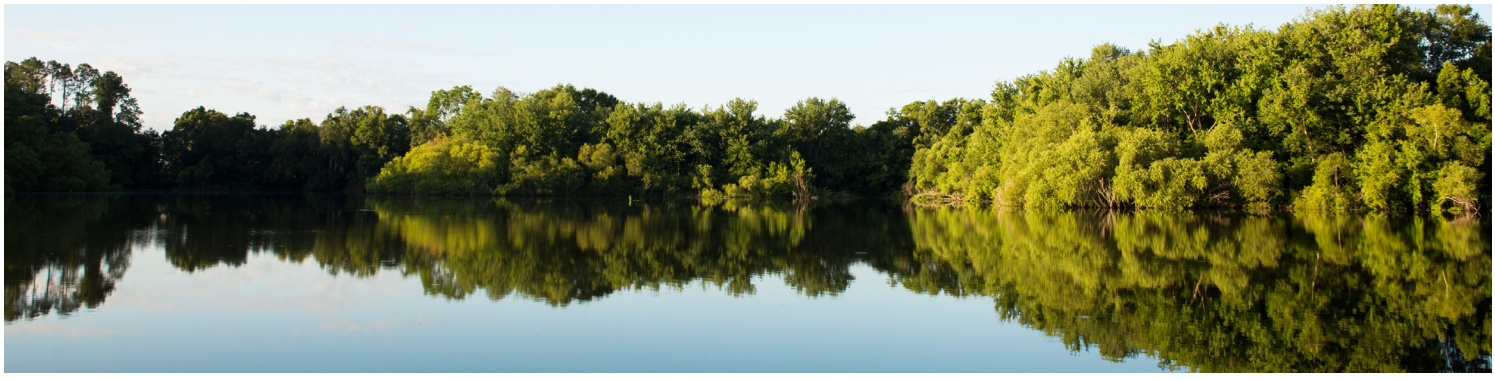
Understanding Collaborative Network Arrangement Around Wildmeat Trade Enforcement and Regulations in the Ecuadorian Amazon

Wildmeat is an important source of protein for many people worldwide, but its trade and consumption can be illegal in certain contexts. Despite the implementation of regulatory and conservation strategies, non-compliance and lack of cooperation prevail in Ecuador. This study aims to improve the social-ecological fit of the regulatory framework for illegal wildmeat trade in the Ecuadorian Amazon by understanding 1) actors' collaboration network involved in enforcement and regulation, and 2) factors that promote or hinder cooperation among actors. We used semi-structured interviews with key local actors to identify the collaborative network and understand actors' perspectives in terms of illegal wildmeat trade. The preliminary analysis showed that 66 actors were involved in the collaborative network, representing different societal spheres and at different jurisdictional scales. Actors had different measures of network centrality that could be explained by the diversity of their perspectives on the illegal wildmeat trade situation and potential solutions.

Jordan Bajema, Ph.D. student (Advisors: Dr. Mike Allen and Dr. Will Patterson) Poster #3

Trophic Interactions between Common Snook and Two Sciaenid Sportfishes in the Suwannee River Estuary, Florida

Common snook have expanded the northern limit of their range over the past decade along Florida's west coast. This research focused on describing trophic interactions of common snook with two other economically important species: red drum and spotted seatrout. Our objectives were to evaluate 1) species-specific diet changes seasonally or among size classes, 2) differences in diet among species, 3) assess overlap in species-specific isotopic niches, and 4) competition or direct predation between range-expanding snook and the two sciaenids in the Suwannee River Estuary. Stomachs were collected among all three species and their contents were visually identified. Similar prey were consumed among the three species, but prey taxa occurred in different proportions. Stable isotope analysis of muscle tissue samples revealed broad overlap in isotopic niches across all three species. The diet and isotope data revealed snook and the two sciaenids likely compete for similar prey resources in the system.



Xiaoxing Bian, Ph.D. student (Advisors: Dr. Vanessa Hull and Dr. Madan Oli) Poster #5

Human-Snow Leopard Conflict in Tibet

The snow leopard, an endangered species found throughout central Asia, shares its habitat with pastoralist communities. The Tibetan Plateau in China has historically supported a stable population of snow leopards but remains understudied in terms of human-wildlife conflict. We conducted household interviews (n=190) in 12 villages in the Tibet Autonomous Region of China to determine attitudes and behaviors toward snow leopards and associated conflicts. The questionnaire asked about socio-demographic and economic attributes and experiences with conflict mitigation tools. Regression analysis showed a bimodality in attitudes, combining strong positive and negative attitudes, with a significant negative effect of livestock-based income on attitudes toward conflict. Respondents relied on herder guarding, repellents, barriers, and guard dogs as mitigation tools. These findings provide a unique understanding of human-carnivore conflicts in Tibetan pastoralist communities that can inform future management decisions.

Allison Cauvin, Ph.D. student (Advisors: Dr. Julie Meyer and Dr. Andrew Altieri) Poster #7

Integrative Metagenomics to Evaluate Coral Disease Resistance

Stony coral tissue loss disease (SCTLD) is damaging Caribbean coastal ecosystems and the pathogen remains unknown. Individuals of *Orbicella faveolata* display varying levels of SCTLD resistance, but little is understood about what drives these differences. Therefore, a multi-disciplinary approach was undertaken to study drivers of SCTLD resistance. Cores from 90 O. *faveolata* colonies were collected from two regions (Southeast Florida and the Lower Keys) and three levels of SCTLD resistance (Low, Medium, and High) across three sampling periods. Cores were distributed for multiple analyses, including metagenomics, with the goal of integrating the data generated. Metagenomic sequences are currently running through bioinformatic pipelines. Additionally, vibriolysin from coral pathogen *Vibrio coralliilyticus* was quantified from each core. While not significantly different across resistance groups, vibriolysin amounts spiked during the third sampling period. The results of this study will provide a better understanding of coral disease resistance for optimized SCTLD intervention strategies.

Ankita Datta, Ph.D. student (Advisor: Dr. Patrick Inglett) Poster #4

Soil and Nutrient Accretion Rates in Everglades Stormwater Treatment Area Wetlands

The Everglades Stormwater Treatment Areas (STAs) are a complex of large, constructed wetlands that are an integral component of the State and Federal efforts to treat runoff from surrounding agricultural areas before it reaches the Everglades. The aim of this study was to determine the accumulation rates of macro-elements including nitrogen (N), carbon (C), phosphorus (P), sulfur (S), and associated secondary elements including calcium (Ca), magnesium (Mg), aluminum (Al), and iron (Fe) in multiple Everglades STAs over their periods of operation. Soil accretion and nutrient accumulation were measured in the northern, central, and southern regions to evaluate the effects of anthropogenic nutrients and nutrient storage during the past century as they relate to STA performance. The study was conducted in two flow-ways of STA-1 East, two flow-ways of STA-2, the Western Flow-way of STA-3/4, and the Central Flow-way of STA-5/6. In general, flow-ways with SAV were more efficient than EAV in accreting mineral matter, resulting in increased bulk density and higher accumulation rates of elements. Phosphorus accumulation rates were approximately 2–3 times higher in SAV than in EAV flow-ways.

Silvia de Melo Futada, Ph.D. student (Advisors: Dr. Karen Kainer and Dr. Joel Correia) Poster #6

Closing Roads, Opening Worlds: Waimiri Atroari Indigenous Society (Brazil) and Environmental Justice

Indigenous people have been in the Amazon for at least 12,000 years, and the European invasion led to disrupted sociocultural systems, depopulation, loss of territories, and landscape transformation. The Waimiri-Atroari indigenous Carib group was one of these societies which resisted betrayal, hunting, and killing. With the acquiescence or involvement of the Brazilian State, they were reduced from an estimated 3,000 (1900) to 374 people (1980s). Demarcating and protecting indigenous lands is an efficient strategy to promote land tenure justice, prevent deforestation, and conserve ecosystem processes and local knowledge systems. Waimiri-Atroari's traditional territory was partially demarcated in 1987. However, was it enough to do justice? This preliminary study analyzed how three different aspects of justice—procedural, redistributive, and retributive—were applied in this case and how the approach of the concepts of relational justice and justice as recognition can contribute to achieving environmental justice in Waimiri-Atroari territorial governance.

Sinomar Ferreira Da Fonseca Junior, Ph.D. student (Advisors: Dr. Stephen Perz and Dr. Catherine Tucker) Poster #9

Strategies of Indigenous Peoples Facing Infrastructure Projects in the Middle Madeira River, Southern Brazilian Amazon

This dissertation aims to understand the strategies of indigenous peoples seeking to resist planned infrastructure projects. Political ecology and environmental governance are used as a theoretical approach for the study case of BR-319 paving in southern Amazonas state, a highly diverse region of biodiversity and culture in the Brazilian Amazon. The data collection included interviews, focus groups, Q-methodology, and observations gathered in governmental agencies, conservation organizations, and indigenous communities. Comparative analysis between different stakeholders and indigenous lands permitted the identification of distinct strategies involved and how the mobilization process has unfolded. The findings point to a suite of mobilization strategies that indigenous peoples combine to protect their lands and ensure their rights in the face of infrastructure projects. Indigenous people mostly considered Free, Prior and Informed Consent (FPIC) to be appropriate to their needs, culture, and livelihoods. The findings also indicate that indigenous peoples prefer a relational approach in their mobilization strategies in ensuring their rights.

John Harling, Ph.D. student (Advisor: Dr. Esteban Rios) Poster #8

Quantifying Ecosystem Services Using Remote Sensing and Machine Learning

Quantifying ecosystem services can improve land management, thereby maximizing ecosystem function. However, measurement is quite arduous due to ecosystem complexity. Therefore, this research aims to quantify ecosystem services by using various data sources to train a deep machine learning system to estimate and map plant biodiversity and soil carbon sequestration using satellite imagery. Multispectral satellite images, UAV hyperspectral images, land use data, and ground truthing data are being added to the deep learning system to achieve an improved understanding of current levels for these services. Ground truthing data are being collected throughout Florida to aid in confirming remote sensing data accuracy. This presentation addresses the current progress of this effort. Data collection from ground truth data, public maps, and multispectral satellites is underway. A pipeline is also being developed to compile this information for the proposed artificial intelligence system that will aid in building the Florida ecosystem services map.

Drew Hiatt, Ph.D. student (Advisor: Dr. Luke Flory) Poster #11

Mechanisms of Invasive Plant Spread: The Role of Local Adaptation and Post-Introduction Hybridization in Frost Tolerance

To identify habitats vulnerable to invasion, better information is needed on mechanisms underlying invader success across environments. Brazilian peppertree (*Schinus terebinthifolia*) is a highly problematic invasive plant species that is spreading northward from South Florida. Separate haplotypes were introduced to Miami from northern Brazil and to Punta Gorda from southern Brazil, which has a much colder climate than northern portions of the country. The two haplotypes have hybridized extensively, and hybrid individuals may be more tolerant of colder temperatures at more northern latitudes. For this project, I will collect seeds from across the invaded range and will expose seedlings to a variety of frost treatments that will mimic conditions beyond the current northern extent of its range. I will measure plant performance traits before, during, and after the frost treatments to determine the effect of hybridization and local adaptation on frost tolerance, which will inform potential for northward range expansion.

Samantha Howley, M.S. student (Advisor: Dr. Matt Cohen) Poster #10

Metabolic Responses of River Intrusion Events in Florida's Springs

Sunlight and flow constrain net ecosystem productivity (NEP) in lotic ecosystems. While North Florida's spring runs boast stable discharge of the clearest freshwater in the world, flood events in downstream receiving waters can cause more water storage, higher stage, and slower flow rate of the runs. During severe floods, the stage of receiving waters even exceeds the aquifer stage, causing flow to reverse direction, further increasing spring stage and often introducing tannin-stained water to the spring. Flow variation controls NEP by influencing benthic light availability via changing water depth and clarity. These river-water intrusion events are hypothesized to be a regular feature of river-adjacent springs, with important implications for the metabolic regime of the spring-run ecosystems. We investigated the effects of river-intrusion events on NEP of five spring-runs along the Suwannee River using hourly measurements of dissolved CO2, dissolved O2, and water depth data. We discovered low stage fosters higher NEP while high stage and flow reversals can shift spring metabolism to favor CO2 production.

Alexis Irvin, B.S. student — Poster #13

An Interactome of the Francisella Type VI Secretion System Reveals Novel Protein-Protein Interactions

Francisella tularensis is a causative agent of tularemia, a lethal disease transmitted through aerosolization and arthropod vectors. *Francisella* encodes a type VI secretion system (T6SS) that injects toxic proteins into host cells to facilitate bacterial virulence. To characterize this system, we set out to define the protein-protein interactions (PPIs) of the *Francisella* T6SS apparatus. We engineered strains of Francisella novicida to encode epitope fusions with each of the FPI-encoded genes and immunoprecipitated the FPI-encoded proteins. Following quantitative mass spectrometry, we constructed an interactome to map the PPIs of the Francisella T6SS. To determine if the interaction of two specific proteins are required for T6SS activity, we constructed point mutations in the protein IglA. These mutations abrogated interactions with a second protein, IglB, and this blocked T6SS activity. The interactome we have generated will drive future studies on T6SS PPIs that can serve as future drug targets to block *Francisella* pathogenesis.

Jesse Jones, Ph.D. student (Advisor: Dr. Basil Iannone) — Poster #12

Enhancing Socioecological Outcomes in Residential Landscapes: Modeling Prioritized Ecosystem Services in Response to Components of Plant Diversity and Species Origin

There is a growing demand for residential landscaping that provides enhanced ecosystem services (ESs), yet there is a lack of research on strategies to achieve these goals. This study assesses which ESs homeowners prioritize from their yards and the degree to which these goals are achieved through various landscaping components. From a diverse sample of 90 homeowners and their yards, we first administered a landscaping priority ranking exercise. Top-ranked results informed selection of ESs (aesthetics, comfort, soil fertility, wildlife habitat, useful plants, and utility) to model as a function of diversity components (gamma diversity, beta diversity, abundance, and evenness) for each grouping of native and nonnative plant species. ES performance was quantified from data spanning herbivory, soil, and social surveys; diversity metrics were quantified from comprehensive vegetation surveys. This research will inform landscaping design and management strategies that lead to improved socioecological outcomes in both existing and expanding residential landscapes.

Yiyang Kang, Ph.D. student (Advisor: Dr. David Kaplan) — Poster #15

Linking Mangrove Vegetation Structure and Carbon Storage Across a Tropical-Temperate Transition Zone

Warming-induced mangrove poleward expansion is shifting dominant plant cover across the tropical-temperate transitional zone and may affect carbon storage in coastal wetlands. In this study, we quantified the relationship between mangrove vegetation structure and organic carbon (OC) storage, both in soil and vegetative biomass, at 15 sites across the Florida Gulf Coast. Carbon storage in mangrove aboveground biomass and belowground biomass was estimated using allometric equations and varied from 0 to 224 and 0 to 103 Mg/ha, respectively. Soil OC density exhibited a positive relationship with mangrove aboveground biomass, suggesting that increasing mangrove biomass could provide higher soil carbon storage as it displaces marsh-dominated wetlands. Soil δ13C isotopic signatures were higher at lower mangrove aboveground biomass (i.e., at the northern range limit) and deeper in the soil profile, suggesting mixed OC sources from C4 marsh plants and C3 mangroves, but with increasing mangrove OC input in recent years of poleward expansion. With increasing mangrove biomass, soil TN increased but C/N remained constant, indicating that mangroves contribute to higher nitrogen storage without significantly altering this measure of litter quality. A decreasing δ15N with increasing mangrove biomass may suggest a reduction in microbial decomposing activity, which could contribute to higher OC storage in mangrove soil. Collectively, these results revealed that mangrove poleward expansion could increase OC storage in coastal wetland soil over time, implying the important ecological consequences of this climate-induced shift in foundational species.

Medelin Kant, Ph.D. student (Advisor: Dr. William Hammond) — Poster #14

Hotter-Drought Killing Pines? A Global Analysis of Mortality Drivers and Lethal Limits for Pinus

Recent global observations of drought and heat-associated tree die-off found 25/154 mortality-observed tree species to be in Pinus, a genus containing some of Earth's oldest, most resilient species. Our objectives were to identify: 1) abiotic agents driving observations of widespread Pinus mortality in recent decades and 2) abiotic stress tolerances for Pinus to determine physiological thresholds for survival. We conducted a review of existing studies to determine the proportion of *Pinus mortality* by abiotic driver (drought, heatwaves, heat-drought). Secondly, we determined the proportion of Pinus species for which lethal limits have been measured. Our synthesis reveals the leading mortality drivers was drought, while heat-drought increased in recent years. Nearly half of Pinus species do not have abiotic stress tolerance measurements and <10% had any described heat thermotolerance. Our future work aims to determine lethal limits across this climate-threatened genus, including some of the 52 species that have never been measured.

Ashpreet Kaur, Ph.D. student (Advisor: Dr. Christine Overdevest) Poster #17

Campus Zero Waste Program: Toward a Better Understanding of Zero Waste Program Success

The increasing population, which overconsumes resources, has led to increased waste production, which, if improperly handled, can lead to serious environmental and health hazards. To reduce excessive waste production, the linear consumption pattern needs to convert into a circular chain. Zero Waste (ZW) uses the concept of a circular economy aiming at diverting 90% of waste from landfills or incinerators through circular activities such as reducing, reusing, recycling, re-selling, and composting. While studies have proposed tools and factors to measure the performance of ZW programs in cities, this study quantitatively analyzes different micro, meso, and macro level factors that lead to successful ZW programs at higher education institutions (HEIs) in the United States of America (US). The study uses the Sustainability Tracking, Assessment & Rating System (STARS) dataset and other secondary data to conduct a linear regression analysis of micro, meso, and macro factors predicting the success of ZW programs measured by higher waste diversion and minimization. A centralized mandatory procurement plan can help in diverting the most waste from landfills and improve ZW programs in HEIs.

David Klinges, Ph.D. student (Advisor: Dr. Brett Scheffers) Poster #16

Patterns of Climate at Ecologically Relevant Scales

Understanding how climate change shapes the environment and society requires explicit consideration of the scale of climate data, yet many popular sources of climate data are too spatiotemporally coarse to actually represent climate as experienced by most organisms. Here, we present a novel global microclimate database, Dirtclim, which is the highest resolution climate product ever produced, and represents the conditions that organisms actually experience. When validated using data from hundreds of temperature loggers, Dirtclim outperformed two popular climate products, ERA5 and WorldClim, by 21% and 28.5%, respectively. We then leveraged DirtClim to drive several ecological models, and demonstrated how such improvements in temperature prediction yield even more substantial improvements in ecological prediction. Using high resolution microclimate data, instead of macroclimate, improves understanding of ecological responses to climate, with applications as diverse as crop yields, human comfort, disease, and species' range shifts.

Beatrice Kyasiimire, Ph.D. student (Advisor: Dr. Mark Hostetler) Poster #19

Living Near Uganda's Protected Areas: Evolution of Perceived Benefits, Problems and Behavioral Intent to Adopt Alternative Crops to Reduce Elephant Raiding

In Uganda, despite conservation efforts through the establishment of national parks, biodiversity is still threatened from surrounding land use such as settlements and agriculture. Wildlife/human conflict, such as elephant raiding of crops, can be quite significant for communities living near the parks. Support for the park may vary depending on how differently people view how the park impacts their livelihood and overall well-being. Benefits from revenue-sharing projects, tourism- and park-related employment, and resource access can influence attitudes towards protected areas. My study will 1) assess local peoples' changing perceptions of protected area benefits and problems around Kibale National Park, and 2) determine farmer perceptions and behavioral intent of adopting proposed unpalatable crops in high human/wildlife conflict zones around Queen Elizabeth National Park. Ultimately, understanding the evolution of perceived benefits, problems, and attitudes of local people towards wildlife and protected areas is key to improving conservation strategies.

Saneer Lamichhane, Ph.D. student (Advisor: Dr. Madan Oli) Poster #18

Non-Exploitative Human Disturbance Provides Shelter for Prey From Predators

Human activities can influence the behaviors of predators and prey, as well as predator-prey interactions. Using camera trap data, we investigated whether or to what extent human activities influenced the behaviors of predators (tigers and leopards) and prey, and predator-prey interactions in the Barandabhar Corridor Forest, Chitwan, Nepal. A multispecies occupancy model revealed that the presence of humans altered the conditional occupancy of both prey and predator species. Specifically, the conditional occupancy probability of prey was substantially higher (Ψ = 0.91, CI = 0.89-0.92) when humans were present than when humans were absent (Ψ = 0.68, CI = 0.54-0.79). The diel activity pattern of most prey species overlapped strongly with humans, whereas predators were generally more active when humans were absent. Finally, the spatio-temporal overlap analysis revealed that human-prey interactions were ~3 times higher (10.5%, CI = 10.4%-10.6%) compared to spatio-temporal overlap between human-predators (3.1%, CI = 3.0% – 3.2%). These findings support the human-shield hypothesis, suggesting that ungulate prey species may reduce predation risk by using areas with high human activities.

Dakota Lewis, Ph.D. student (Advisor: Dr. Andrew Altieri) Poster #21

Predicting Shifts in Demography of Orbicella franksi Following Simulated Disturbance and Restoration

Disturbances of coral reefs are increasing in frequency, intensity, and duration. These changes will likely result in demographic shifts in many populations of corals with unknown consequences for coral restoration efforts. To address this knowledge gap, here we use stage-based matrix population models to predict how a stable population and areal coverage of *Orbicella franksi* may change under simulated disturbance and restoration scenarios. Overall, simulated restoration outplanting greatly increased the number of *O. franksi* colonies and overall areal coverage when compared to baseline population estimates. Under both disturbance scenarios, the number of *O. franksi* colonies were projected to decrease. However, simulated restoration offset the loss in number of colonies in the mild disturbance scenario. Additionally, under both disturbance scenarios there was a large projected loss of *O. franksi* areal coverage even when restoration was implemented. However, restoration did slow the loss of coverage. These findings highlight the potentially catastrophic effects of disturbances on previously stable coral populations, and the role restoration can play in mitigating these threats.

Vanessa Luna-Celino, Ph.D. student (Advisor: Dr. Bette Loiselle) Poster #20

Fire in the Peruvian Andes: Community-based Fire Management and Stakeholder Perceptions of Fire Governance

My doctoral research aims to contribute to understanding community-based fire management, and stakeholders' perceptions of the role of fire in livelihoods and ecosystems and wildfire solutions. It focuses on the southern Peruvian Andes, as this is the region where most wildfires occur in the country, and there are no studies on fire management and governance. Here, a good portion of the land is collectively owned and managed by campesino communities that have a high level of collective participation in natural resources management. My three main questions are 1) What are the stakeholders' perceptions of the role of fire on livelihoods and ecosystems and of different fire management strategies? 2) How is fire currently managed in Quechua communities? And 3) How has fire use and management changed over the last decades? I am using a qualitative-dominant mixed methods approach, including participatory methods, in a multiple-case study design.

Kendall Mackin, B.S.student Poster #23

Quantifying the Effects of Different Cover Crops and Fertilizer Approaches on Permanganate-Oxidizable Carbon in Florida Soils Cropped With Organic Vegetables

Cover cropping and integrated fertilizer management could improve soil health and reduce off-target effects from traditional fertilizers in organic vegetable production. A two-year study was designed to research the effects of five cover crop assortments and two fertilization approaches on the production of pepper, squash, and bok choy in Florida. Permanganate-oxidizable carbon (POXC) values were quantified on air-dried soils before and after cover cropping, and after cash crop harvest. As POXC concentrations in soils can approximate the availability of soil organic matter to soil microbes, it was expected that POXC values would increase with increased species diversity of cover crop assortments. Data from first-year samples indicates an increase in soil POXC at harvest relative to earlier sampling events, although no significant changes can be attributed to the cover crop assortments. The pending data on second-year samples may clarify the effects of cover crops and fertilization approaches on POXC.

Miranda Mays, B.S.student Poster #22

The Use of Geographic Information Systems in the Ordway-Swisher Biological Station User Experience Design Project

Every year new plant populations are discovered, making it difficult for scientists to remain updated in this field, which is why projects such as the Ordway-Swisher Biological Station (OSBS) User Experience Design Project are necessary for the progression of research in plant sciences and ecology. This project is the creation of an interactive map made for researchers that includes every known species of plant located on the premises, along with specific information such as reproductive season and conservation status. We began creating this map by logging plant species data using OSBS and the Florida Museum of Natural History's herbarium, which contains plant specimens and their details. We transferred this information to ArcGIS Online to add the plant locations to the map of the station. This map will aid scientists in their research at OSBS by giving them specific information about species of interest and where they are located.

Tina McIntyre, Ph.D. student (Advisor: Dr. Laura Warner) Poster #25

Fertilizer Workshops Impact Fertilizer Behaviors

Many waters in Florida are impaired by nitrogen (N) from non-point sources, with urban turfgrass fertilizer largely contributing. From 2018 to 2022, 79 fertilizer workshops were used to educate 2,714 group learning participants about fertilizer Best Management Practices (BMPs). A follow-up survey revealed 613 participants followed UF/IFAS recommendations and used a 50% slow-release-nitrogen fertilizer, reducing annual N leaching by 596 pounds, which corresponds to an economic benefit of $297,918. We calculated the N leaching reduction from participants complying with the fertilizer restricted period. 578 individuals reported following the restricted period requirements, which equated to a reduction of 1,143 pounds of N, with a monetary value estimated at $571,353. Educational efforts resulted in significant behavior changes which reduced local levels of nitrogen. Because of these workshops, participants better understand sources of water contamination resulting from fertilizer misuse and acted to change those behaviors.

Jeffrey Mintz, Ph.D. student (Advisor: Dr. Mathew Leibold) Poster #24

Exploratory Data Analysis of Bat Acoustic and Lidar Data – Naval Submarine Base, Kings Bay, Georgia

Tree-roosting bats of North America continue to face pressure from disease, wind energy, and habitat loss, but the distributions of tree bats within southeastern coastal plains are not well known. To assess presence and habitat utilization, managers at Kings Bay Naval Submarine Base conducted acoustic surveys over a two-year period, identifying 13 species of bats. Concurrently, vegetation height was measured using lidar across the base. We explored factors that could drive bat utilization, such as distances to water, lighted areas, roads and forests using regression. We also investigated whether there exist groups of bats that prefer different heights of vegetation, using a clustering model to describe three overlapping bat and foliage communities. The results suggest that while bat utilization was not strongly affected by lighting conditions or distance to water, there may exist tree-height preferences for groups of bats which can be taken into consideration in future management decisions.

Brooke Moffis, Ph.D. student (Advisor: Dr. Basil Iannone) Poster #27

Ecology in Florida's Expanding Residential Landscapes: Quantifying Approaches and Attitudes

Residential landscapes can have negative impacts on natural resources, including habitat loss, water resource stress, and water quality reduction. Despite awareness of these issues, many Florida landscapes prioritize aesthetics over mitigating these impacts. This dissertation aims to reimagine home landscapes by developing ecologically oriented and resource efficient approaches. Understanding the attitudes and conflicts surrounding these non-traditional methods will be crucial to their adoption. Objectives include measuring native plant health under varying irrigation and soil-compost regimes and quantifying the benefits and perception of mixed species lawns. Social attitudes will be captured through stakeholder interviews. Preliminary results show that compost amendments maintain native plant quality and attract more pollinators, while mixed species lawns increase pollinator activity and herbivore species richness but decrease stakeholder acceptance. Findings will influence approximately 33,000 future home landscapes and define constraints and opportunities for sustainable landscapes.

Fernando Noriega, Ph.D. student (Advisor: Dr. Vincent Lecours) Poster #26

Characterization of Marine Vessel Distribution to Inform Mitigation Strategies for Conflict Between Ocean Users and the Protected Humpback Whale (Megaptera novaeangliae) in Bahia de Banderas, Mexico

This research explores the spatiotemporal distribution of marine vessels in a tourist hotspot and humpback whale wintering site, Bahia de Banderas, Mexico, from 2018 to 2022. Using high-resolution satellite imagery, we could identify that the vessels' spatial distribution in the study area is not random; four areas show clusters of higher boat densities. Distances to vessel departure points, urban areas, and the coastline are significantly related to vessel density at sea: the shorter the distance to these elements, the higher the density. Moreover, the density of vessels increased significantly in 2021 after the restrictions put in place for the COVID-19 pandemic were lifted. This increase persisted through 2022, which could indicate behavior change caused by COVID-19 social distancing recommendations. The work provides a reproducible methodology to characterize the distribution of boats in other sites based on satellite optical imagery that constitutes a reliable and easily accessible data source.

Chad Palmer, Ph.D. student (Advisor: Dr. Ed Camp) Poster #29

A Multistate Analysis of the Governance of Crassostrea Virginica in the United States

Governance of fisheries in the United States is typically done on a local level rather than the federal government. This localization often leads to significant differences between fisheries management strategies among relatively close areas, providing a unique opportunity for comparison of the efficacy of these management strategies. This research examines the various management paradigms by which *Crassostrea virginica* (eastern oyster) fisheries in the United States operate. Eastern oyster landings data are then used as a response metric to determine which of these management strategies correlates most strongly with a more robust oyster fishery.

Justin Pitts, Ph.D. student (Advisor: Dr. William Hammond) Poster #31

Detangling Relationships Between Aflatoxin Formation, Plant Physiological Status and Drought Stress in Peanut (Arachis hypogaea)

Aflatoxin is a major concern for human and economic health worldwide. It is categorized as Group-1 carcinogen with exposure leading to increased risk for liver cancer, failure and birth defects. Empirical evidence shows links between drought, soil conditions and aflatoxin formation in peanuts, yet few inroads have been made on detangling these relationships further. My research investigates these interactions under both field- and greenhouse-grown conditions via a four-pronged approach. This study assesses the relationships between aflatoxin formation and 1) soil environment 2) links to above ground physiological and spectral characteristics for early detection 3) exposure to early-season deficit irrigation and 4) across cultivars. Results have shown that that early-season deficit irrigation can lead to a reduction of aflatoxin, though often at the cost of yields. Additional links between drought and physiology are evident, with preliminary data suggesting that drought stress can be detected via physiological and spectral signatures. This research can guide future management decisions and potentially lead to reduced incidence of aflatoxin formation and consumption globally.

Audrey Plauche, B.S. student Poster #28

Pond Pine (Pinus serotina) and its Ecology in Relation to Hydrologic Gradient

Pond pine (*Pinus serotina*) is a pyrophytic tree species found within the Southeastern Coastal Plain of the United States. Compared to other pine species, little is known concerning the ecology of pond pine, its spatial extent in the landscape, and its use in restoration. To help fill this gap of knowledge, our study examines how *P. serotina* performed in a restoration project across differing hydrological gradients. For this study, we planted 206 total *P. serotina* across two different management sites (Austin-Cary Forest and Mud Swamp Tract Wildlife Management Area) and across four hydrological gradients at each site. The following year, we will measure both the growth heights as well as survivorship of the trees. We expect to find that *P. serotina* will perform the best in these variables in moderately hydrated zones. Our findings will help provide insight into the ecology and restorative application of *P. serotina*.

Varshitha Prasanna, Ph.D. student (Advisor: Dr. Vivek Sharma) Poster #33

Development of Integrated Precision Irrigation and Nitrogen Management Strategies for Potatoes

Scarcity of water is a global problem, resulting from climate change and population increase. The right resources must be used at the right time to meet the potato plant's needs and minimize losses in order to increase efficiency. A field experiment on precision irrigation and nutrient management in potato was carried out during Spring 2022 at NFREC-Suwannee Valley, Live Oak with the objective of quantifying the impact of irrigation and nitrogen on potato yield. Three levels of irrigation as a main plot treatment with eight sub-plots varying nitrogen treatments were laid out in a split-plot design. Soil and tissue samples were collected to understand the dynamics of nutrient leaching. The results revealed that among the irrigation treatment FIT had highest yield. Among the nitrogen treatment, nitrogen applied at 300 lb./acre in equal split doses throughout the growing season had highest yield [322 (100 CWT/ac)] compared with all other treatments. The highest percent of A-grade potatoes (78%) with low rots (5%) are found in FIT at 350 lb./acre nitrogen application. Timely application of irrigation and nutrients will save water and increases the yield.

Anu Rai, M.S. Student (Advisor: Dr. Nia Morales) Poster #30

Assessing Women's Roles and Participation in Buffer Zone Community Forestry, Chitwan National Park of Nepal

Women have unique roles and knowledge of natural resources, which is crucial in successful community-based conservation. Yet in many cases, they may be underrepresented or face challenges or barriers to full participation. For this study, I explored factors affecting women's participation in the buffer zone community forest (BZCF) of Chitwan National Park (CNP) in Nepal. I used key informant interviews to understand the CNP involvement in women's participation (including indigenous women) in decision-making and activities related to conservation. Additionally, I conducted card-sorting activities and walking interviews to understand both men's and women's perceptions of their roles and participation in the BZCF. Preliminary results suggest that cultural norms surrounding gender roles, lack of active recruitment and engagement of women, and factors related to the structure of BZCFs and CNP impact women's participation. The results of this study yield recommendations of ways to improve women's participation in community-based conservation.

Jenna Reimer, Ph.D. student (Advisors: Dr. Ashley Smyth and Dr. AJ Reisinger) Poster #35

Spatiotemporal Variability of Estuarine N-cycling

Denitrification and nitrogen fixation are essential yet opposing microbially-mediated processes in the nitrogen (N) cycle. Denitrification permanently removes reactive nitrate (NO3) from the biosphere, while N-fixation converts dinitrogen (N2) gas into bioavailable forms of N. Increased N inputs into a water body due to human activities can disrupt the balance of N availability, fundamentally shifting the dynamics between N-fixation and denitrification. Changes in N-cycle dynamics can lead to excess reactive N and can subsequently cause eutrophication of coastal waters. Understanding the relative importance and environmental drivers of each pathway can assist managers with water quality goals when faced with excess N. Using lab incubations of sediments collected from 10 locations along an estuarine salinity gradient, we quantified the relative sinks (denitrification) and sources (N-fixation) of N2 gas each month in order to develop a spatio-temporally explicit N budget. By assessing drivers and variability of N sources and sinks, we can gain a mechanistic understanding of N dynamics that can be used to better manage N, protecting estuarine water quality and ecosystem services.

Esteban Rodofili, Ph.D. student (Advisors: Dr. Vincent Lecours and Dr. Ed Camp) Poster #32

Object-based Image Analysis Automated Detection of Whales on Remote Sensing Imagery

Marine mammal surveys through airplanes or ships can be logistically complex, costly and dangerous to researchers. In recent years, remote sensing imagery has become an alternative to conducting marine mammal surveys. However, the manual revision of such imagery is time intensive for researchers. Different methods have been recently used to develop workflows for automated detection of marine mammals, such as convolutional neural networks, or histogram thresholding, among others. Object-based image analysis has been a less explored method in the detection of marine mammals. In this work, we used remote sensing imagery to automatically detect whales. We assigned the imagery to create training and testing datasets to develop an object-based image analysis workflow in the eCognition software. We present preliminary results on the performance of the workflow in whale detection.

Adam Searles, Ph.D. student (Advisors: Dr. Charlie Martin and Dr. Laura Reynolds) Poster #37

Shifting Macrophytes: Thalassia and Caulerpa Support Unique Ecological Communities

Macroalgae are replacing seagrasses in marine ecosystems across the globe. Macroalgae can support unique faunal assemblages compared to seagrasses and can therefore drive changes in community structure as they increase in abundance. However, changes in the relative abundance of marine macrophytes often occur as a result of anthropogenic impacts such as eutrophication. These background conditions often hamper attempts at isolating the effects of seagrass replacement by macroalgae on ecological communities. To understand how changes in macrophyte abundance affect ecological communities, we sampled *Thalassia testudinum*, *Caulerpa prolifera*, and *Caulerpa paspaloides* monocultures and mixed habitats for benthic fauna in a minimally-impacted system: Crystal Bay, Florida. Species composition and diversity differed among habitats and sampling times. Temporal changes in species composition reflected seasonal shifts in macrophytes. Differences among habitats and seasons were driven primarily by abundance differences of numerically dominant species. These results suggest that seagrasses and macroalgae support complex, yet unique communities.

Yuseung Shin, Ph.D. student (Advisor: Dr. Matt Cohen) Poster #34

Nutrient Limitation in Greenland Streams

Although Arctic regions are experiencing rapid climate change, with impacts to nutrient release from melting ice and thawing permafrost, the impacts of changing nutrient conditions in Arctic streams remain poorly understood. To address the hypothesis that nutrient limitation is prevalent in Arctic streams due to high light conditions and low nutrient concentrations, we conducted nutrient enrichment experiments in 5 western Greenland streams, 2 in the interior and 3 near the coast. We conducted two types of experiments, nutrient diffusing substrate (NDS; all sites) and whole-stream nutrient pulse-injection (1 site in each region), with three nutrients (N, P, Fe). Nutrient experiments were conducted twice during peak and late summer. Inland streams showed clear N limitation in the early season but no limitation later in the season. In contrast, coastal streams had consistent N limitation and colimitation of either P or Fe. These results suggest that nutrient controls primary production in Greenland streams but with spatiotemporally varying impacts.

Muzi Sibiya, Ph.D. student (Advisor: Dr. Rob Fletcher) Poster #39

Long-term Effects of Shrub Cover on Bird Community Dynamics in a Southern African Savanna

Over the past few decades, open terrestrial ecosystems such as savannas, have experienced a dramatic increase in woody density driven by shrubby vegetation (shrub encroachment). Shrub encroachment effects on faunal communities remain poorly understood. We aimed to investigate the effects of this phenomenon on bird community changes. Using satellite images spanning 22 years, we leverage GIS techniques to quantify shrub cover dynamics and used a hierarchical multispecies occupancy model to assess bird community changes and trait effects. Our results showed that shrub cover increased dramatically in the first 10 years. When shrub cover increased, community occupancy and species richness decreased. Some traits are more important than others in explaining shrub cover effects. Our study reiterates the complexity surrounding shrub encroachment dynamics and that continued monitoring of vegetation change is necessary. Finally, we provide mechanistic insights and potential intervention points for land managers to minimize community effects as shrub encroachment advances.

Ari Siegel, B.S student Poster #36

Changing Migration Patterns of Abundant Fish in Clearwater Harbor Seagrass Beds

Fish migration into and out of seagrass beds is essential to fish lifecycles and to nutrient cycling. Changes in migration phenology would have massive impacts on fisheries and nutrient dynamics in Clearwater Harbor. In this study I analyzed changes in migration phenology of the five most abundant species in seagrass beds of over 50% coverage throughout Clearwater Harbor from 2009-2019. Results indicate significant changes in migration timing due to warming, with focus on seasonal impacts.

Josue St. Fort, Ph.D. student (Advisor: Dr. Carlene Chase) Poster #41

Reducing Water Use in Florida Strawberry Production With Low-Volume Sprinkler Systems

Overhead irrigation for bare-root transplant establishment and frost protection for strawberry production in Florida results in very high water use. This study aimed to conserve water during these operations by comparing four low-volume sprinklers with the commonly used impact sprinkler. The low-volume sprinklers reduced water use by up to 79% for two consecutive years of an on-station trial, with no adverse effects on “Florida Brilliance” growth and yield in 2021-2022. Similar results were obtained for transplant establishment and early yield in the 2022-2023 season. However, two of the four sprinklers will require initiation at temperatures above 34 °F for effective frost protection. One of the best-performing, low-volume sprinklers is being compared to the grower’s system in an ongoing, on-farm experiment. A 42% reduction in water use has been observed with no adverse effects on yield. Therefore, low-volume sprinklers may be a viable option for water conservation in Florida strawberry production.

Sarah Steele Cabrera, Ph.D. student (Advisor: Dr. Jaret Daniels) Poster #38

Genetics of Schaus’ Swallowtail Butterfly (Heraclides aristodemus ponceanus)

Schaus’ swallowtail butterfly (*Heraclides aristodemus ponceanus*) is endangered in the United States and only occurs within hardwood hammock forests in extreme southeastern Florida. We aimed to understand how extant populations of this butterfly are connected to one another both within and outside of Florida. We used a 13-loci target capture probe set to compare DNA from both museum specimens and contemporary butterflies. We are currently analyzing the resulting DNA sequences and will present our results at the SNRE research symposium. This project informs ongoing conservation actions for this butterfly.

Natalia Teryda, Ph.D. student (Advisor: Dr. Ray Carthy) Poster #43

Uncrewed Aerial Systems as Tools for Green Turtle Population Assessment in Coastal Marine Protected Areas in Uruguay

The green turtle is an endangered species which faces several threats. The coast of Uruguay is an important foraging ground for juveniles. Long-term monitoring programs are valuable tools for decision-makers to mitigate possible threats to sea turtles. Due to their spatially complex life cycle, research and conservation efforts rely on new technology and efficient protocols to understand population trends and threats. Recently, drones were introduced for such studies. This project is part of a holistic approach to the conservation of the green turtle and its coastal habitats in the region.

Jessica Tittl, Ph.D. student (Advisor: Dr. Julie Meyer) Poster #40

A Survey of Healthy Caribbean Coral Microbiomes: The Search for Beneficial Microbes for Coral Conservation

The coral microbiome is an important part of the coral holobiont and understanding the healthy coral microbiome could aid in conservation efforts. In the Caribbean, stony coral tissue loss disease (SCTLD) has spread rapidly and impacts over twenty stony coral species. There appears to be intra- and interspecific variations in susceptibility to SCTLD. We surveyed 142 microbiomes from twelve coral species before the arrival of SCTLD in the Caribbean. Microbiome community structure was correlated with coral species and susceptibility, but not location. Some of the predominant genera were previously associated with disease, such as Ca. Aquarickettsia in white band disease and Terasakiellaceae with SCTLD. In addition, blastn searches revealed exact matches to coral-associated Pseudoalteromonas and Thalassobius isolates that have been explored for their probiotic potential. Linking potential functions from genomes of isolates to broad geographical and taxonomic surveys of coral microbiomes will provide data that can inform future conservation efforts.

Natalia Uribe-Castañeda, Ph.D. student (Advisor: Dr. Martin Main) Poster #42

Community Engagement in Coral Reef Restoration

My research goal is to identify successful strategies used by three coral restoration community-based programs in Colombia, Belize, and the United States. I assessed programs to engage communities, restore corals and monitor reef health. I focused on motivations, opportunities, and barriers to engaging communities in coral reef management, restoration, and decision-making. 97.1% of the community members engaged in restoration programs believe that the programs have been successful. 91.7% of the participants consider the selection process fair and equitable. The restoration professionals, contrary to community members engaged, believe that despite the restoration efforts having been valuable, they have yet to be completely successful. Motivations are mainly determined by the sense of belonging to the sea. The motivations of the restoration professionals are rooted in their willingness to protect the reef and its surroundings as well as their sense of responsibility to develop their work.

Ernesto Viveiros de Castro, Ph.D. student (Advisor: Dr. Taylor Stein) Poster #45

Thinking Big: The Role of Mega Trails in Creating Meaning and Sense of Place to Conserve Large Landscapes

This study is part of broader Ph.D. research on the contribution of mega trails to nature conservation. Direct experiences in national scenic trails bring landscapes into people's perceptible realms and create sense of place and place meaning. We surveyed 602 hikers to investigate the sense of place and its spatial scale among hikers on the three trails forming the triple crown of hiking in the United States (Appalachian, Pacific Crest and Continental Divide) and discuss their potential to promote conservation at large landscape scales. Results suggest that implementing mega trails can create extensive meaningful places, facilitating the understanding of ecological processes and helping to promote large-scale nature conservation. Through a brand effect, mega trails have the potential to reach a wider audience, going beyond long-distance hikers and raising the awareness of millions of people who visit natural attractions about the importance of large-scale conservation.

Ana Yoko Ykeuti Meiga, Ph.D. student (Advisor: Dr. Denis Valle) Poster #47

The Influence of Land Use and Land Cover (Lulc) on the Behavioral States and Activity Budgets of Giant Anteaters (Myrmecophaga Tridactyla) in the Cerrado Region

Studies on threatened species in modified landscapes are fundamental for the definition of appropriate conservation plans and strategic mitigation actions. We analyzed the influence of landscape characteristics on movement behavior patterns of a

vulnerable mammal. We used telemetry data from giant anteaters in the Cerrado, collected in Mato Grosso do Sul state, Brazil. To identify anteater behavioral states, we used a nonparametric Bayesian mixture model for movement. The model suggested three states, labeled as “encamped,” “transit,” and “exploratory,” based on movement characteristics. These behaviors are respectively related to resting, exploring for suitable habitat, and transiting with faster and directed movement. Encamped state proportion increased during the day, while proportion of transit and exploratory states were greater at night. Encamped behavior increased in savanna, forest formation, and wetland landscapes, whereas transit state had higher frequency in pasture, forest plantation and mosaics of use classifications, regardless of the time of the day.

Hui Zhao, Ph.D. student (Advisor: Dr. Jiangxiao Qiu) Poster #44

Perceptions of Ecosystem Service From Urban Agriculture: A Survey of the General Public

Urban agriculture provides multiple intangible services to the urban population beyond food production. While widely acknowledged, a comprehensive assessment of these services from the general public is still needed. This study investigates the general public’s perception of ecosystem services provided by urban agriculture in the Miami Metropolitan area, as well as the factors that affect this perception. The survey results illustrated that altruistic cultural services, regulating and supporting services are the most perceived services, while egoistic cultural services and provisioning services are the least perceived. Respondents’ age, race, personal experience, and existing urban agriculture sites in the surroundings significantly contribute to the perception. The results address the importance of multidimensional services provided by urban agriculture and contribute to a better understanding of how urban agriculture can serve as an essential component of urban green infrastructure and its potential to support sustainability and social well-being.

Ran Zhi, Ph.D. student (Advisor: Dr. Jiangxiao Qiu) Poster #46

Soil Fungal and Arbuscular Mycorrhizal Communities in Response to Soil Phosphorus Gradient in Managed Subtropical Grasslands

In this study, we aim to explore how Arbuscular mycorrhizal fungi respond to different soil phosphorus levels and to determine what factors contribute to their response. Our study area consists of subtropical grasslands managed for beef cattle production and was built up by a wide range of legacy phosphorus. Representative rhizosphere soil samples were taken from sites with high, medium, and low soil phosphorus levels and were analyzed for soil characteristics, fungi community, and Arbuscular mycorrhizal fungi species. Our results showed that fungi community composition and diversity were similar across different soil total P levels. However, Arbuscular mycorrhizal fungi showed differences in their relative abundance along the soil phosphorus gradient. Specifically, significant positive correlations between relative abundance of Arbuscular mycorrhizal fungi and soil total phosphorus concentration were observed. Redundancy Analysis ordination showed that total phosphorus, Mehlich-1 phosphorus, pH, and soil moisture had significant correlations with the fungal communities, in which total phosphorus showed the strongest effect on fungal community composition.

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