

Eco Empower: Women Driving Conservation in Ghana through TEK

Anne-Marie Deedei Ayerson^{1,3}, Portia Ama Bansa², Esther Adwoa Asantewaa³, Ama Gyamfua³

¹Agrointroductions Ghana, Accra, Ghana; ²University of Ghana, Legon, Ghana; ³Kwame Nkrumah University of Science and Technology, Kumasi, Ghana Abstract:

Conservation outcomes increasingly depend on the integration of local knowledge systems and marginalized groups into governance, yet these dimensions remain insufficiently addressed across many protected areas in sub-Saharan Africa. In Ghana's Boabeng Fiema Monkey Sanctuary, anthropogenic pressures, including agricultural expansion, firewood harvesting, and the erosion of traditional conservation norms, threaten biodiversity, particularly the endangered white thighed colobus monkey (*Colobus vellerosus*). Despite their critical ecological knowledge, local women remain largely excluded from formal conservation decision making processes.

This study examines how integrating traditional ecological knowledge and strengthening the role of local women influences conservation outcomes using a participatory mixed methods approach. Data were collected through ethnographic research, focus group discussions, participatory mapping, and ecological assessments to document knowledge systems and assess conservation challenges.

The results demonstrate that empowering indigenous women significantly enhances conservation effectiveness and community engagement. Women actively participate in decision-making processes, with some nominated to sanctuary management structures. The findings further show that community-driven strategies are more effective when grounded in local knowledge and cultural practices.

These findings contribute to debates on inclusive conservation by demonstrating that culturally embedded and gender responsive approaches strengthen ecological resilience and support sustainable community-led conservation.

Relic Red Spruce: Forest Ecosystem Conditions at War Spur

Jillian Alexander, P Corey Green
Virginia Tech, Blacksburg, VA, USA

Abstract:

Our research was motivated by one primary question: what is the status and outlook of the relic red spruce population at War Spur in Giles County, VA? Little is known about this population that is potentially threatened by past logging and increasing temperatures. The project was designed to account for every red spruce tree with a diameter at breast height over 5 inches within 100 yards of the War Spur Loop Trail. Geographic coordinates, diameter at breast height, and crown class were recorded for

each tree. We used these data to generate a diameter distribution chart and a map showing the spatial distribution of the red spruce. Additionally, a subsample of total heights was measured and used to build a predictive height model. From our results, we inferred the outlook of this relic spruce population based on silvics for the species. The assessment of this population is significant to further our understanding of the tree species, which is regionally rare and generally found at higher elevations than that at War Spur.

Public Perceptions of Coastal Change and Citizen Science at Rockaway Beach

Jay Sanchez, Madison Anderson, Fariha Tasnim

Rockaway Initiative for Sustainability and Equity , New York, NY, USA Abstract:

The Rockaway Peninsula is increasingly affected by shoreline erosion, rising sea levels, and stronger coastal storms, all of which influence the local environment. As these changes become more noticeable, public awareness and involvement play an important role in supporting coastal resilience and conservation. Citizen Science programs such as CoastSnap—a platform that tracks shoreline change through photos taken by visitors—encourage community members to engage with their environment by learning about coastal change and contributing to scientific initiatives. Comprehending how residents and visitors view these environmental changes can provide valuable insight into public awareness and help encourage opportunities to strengthen community engagement.

Mammal Diversity in Fragmented Urban Forests in Southeastern PA, USA

Thomas J Ardia¹, Daniel R Ardia²

¹JP McCaskey High School, Lancaster, PA, USA; ²Department of Biology, Franklin & Marshall College, Lancaster, PA, USA

Abstract:

This study explores how forest patch size, land use, and human activity shape mammal communities in fragmented forests of Lancaster and York Counties, PA, USA. Since 2015, trail cameras have been deployed across forest patches in urbanized landscapes. Images are processed by a machine learning classifier. Using this long-term dataset, I will present findings on how mammal community composition and diversity vary across sites differing in patch size, surrounding land use, and intensity of human trail use. Results indicate that most forest-sensitive species are absent from these fragmented patches. I will compare these communities to those in a larger, more connected forest network just to the north, where species such as bobcat, fisher, black bear, and higher densities of gray fox persist. Finally, based on these findings, I will suggest steps that

land managers could take to support the return of forest-sensitive species to Lancaster County's remaining wildlands.

Snake Communication Programme: An In-situ Tool for Snake Conservation

Rezoana Arefine

National University, Dhaka, Bangladesh; Kundali Foundation, Chattogram, Bangladesh.

Abstract:

Snake communication programmes are an important tool for the conservation of snakes. These programmes are mainly associated with reducing fear through scientific explanation and public education. The main purpose of conducting a snake education programme is to understand the concerns of the general public toward snakes and to provide appropriate responses to myths and superstitions using scientific knowledge of snake biology and snakebite management guidelines.

This snake education programme was conducted during the Magh-Utsob, a public event that included competitions for school children and common visitors. Around 150 people visited the stall and asked numerous questions about snakes and their biological characteristics. Through this campaign, it was identified that people hold different perspectives on snakes, including myths, superstitions, and misinformation.

The results show that about 70% of participants had similar attitudes toward the Rat Snake (*Ptyas mucosa*) and the Tree Snake (*Chrysopelea ornata*), indicating difficulty in distinguishing between harmless and potentially dangerous species. In addition, 100% of participants had no clear understanding of non-lethal bites of cobra species, and 90% were unaware of proper snakebite management guidelines.

Through this campaign, participants gained valuable knowledge about snakes and their ecological roles. After receiving scientific explanations, many participants were able to reconsider and correct their misconceptions about snakes.

Community Gardens Support Elevated Plant Diversity and Pollinator Visitation in NYC

Maximiliano Ayala, Grace McGuigan, Adam Roddy, Julia Monk

Abstract:

In urban environments, green spaces may provide vital habitat for animal biodiversity. However, urban green spaces can be extremely heterogeneous, including formal parks, grassroots gardens, and private yards and planters of different sizes, management strategies, and environmental characteristics. Pollinator abundance and community composition may vary with many of these factors, such as flower species richness, habitat size and structure, and abiotic variables, which vary heavily across these heterogeneous urban green space types.. However, not much research has been done

in order to characterize the effects that these distinct types of urban green spaces have on pollinator communities. We conducted 40 hours of live pollinator visitation surveys throughout community gardens, city parks, and street planters in NYC, surveying over 100 unique sites. Here we show that plants in community gardens host a wider variety of non-domesticated pollinator species (non-*Apis* and *Bombus* bee species, wasps, ants, and butterflies) compared to city parks, with a 50-100% increase in visitations in community gardens compared to city parks for these species. Our results indicate that community garden management styles result in higher plant species richness compared to city parks and street planters, as more diverse plant selection due to individual gardener choices results in more varied pollinator visitations. Our findings demonstrate that grassroots garden management by city-dwellers in community gardens creates a uniquely diverse environment which is more suitable for non-domesticated pollinator species.

Effect of Low-Temperature Dormancy on the Reproductive Neurohormone AVT

Joshua M Bravo¹, Lauren J Merlino¹, Donovan O Trujillo¹, Hunter McConnell¹, Morgan E Tamez¹, Micheal P LeMaster², Debroah I Lutterschmidt¹

¹University of California, Irvine, CA, USA; ²Western Oregon University, Monmouth, OR, USA

Abstract:

Understanding the physiological systems that mediate the effects of the environment on reproduction is crucial, especially in light of the anticipated impacts of climate change on populations. We used common garter snakes (*Thamnophis spp*) to examine how the extent of low-temperature winter dormancy influences the synthesis of the neurohormone Arginine Vasotocin (AVT). AVT or its homologues (e.g., vasopressin) are found in all vertebrates and play an important role in social, reproductive, and seasonal behaviors. However, it remains unclear whether seasonal changes in environmental temperatures correlate with changes in AVT/AVP in the brain, or whether these effects differ across populations with different life-histories. Using a common garden approach, we compared the temperature responses of sympatric garter snakes collected from Manitoba, Canada (*Thamnophis radix*, *T. sirtalis parietalis*) to those of snakes from western Oregon (*T. ordinoides*, *T. sirtalis concinnus*). During winter dormancy at 4°C in constant darkness, a subset of snakes from each population was sampled at 0, 3, 6, and 13 weeks; we used immunohistochemistry to quantify AVT-labeled cells and fibers throughout the brain. Preliminary results show that *T. sirtalis parietalis* from Manitoba increased AVT-staining within the hypothalamus following 8 weeks of winter dormancy, a critical period of low-temperature exposure that is linked to increased reproductive behavior and changes in hormones. We are investigating

whether the influence of temperature on AVT exhibits phylogeographic variation. These results may inform conservation efforts for species whose reproductive timing depends on environmental temperature.

Elephants, Empathy, and Authority: Framing Conservation Across Political Contexts

Yuqing Bai

Macalester College, Saint Paul, MN, USA

Abstract:

This study examines how international conservation NGOs frame communications on elephant ivory campaigns across two contrasting political contexts: the United States and China. Focusing on the World Wildlife Fund (WWF) and the International Fund for Animal Welfare (IFAW), the paper investigates how advocacy actors adapt endangered species messaging to different political, cultural, and social environments. Drawing on framing theory and constructivist perspectives in international relations, the research analyzes 32 NGO documents, including reports, press releases, social media posts, and campaign materials published between 2015 and 2025. Using qualitative content analysis and coding in ATLAS.ti, the study categorizes diagnostic, prognostic, and motivational frames, along with tone, evidence type, and relationships to government authority. The analysis reveals two communication logics. In the U.S., WWF and IFAW emphasize scientific credibility, enforcement, and individual moral responsibility, combining empirical evidence with narrative persuasion to mobilize civic participation. In China, both organizations adopt pedagogical and aspirational framing, highlighting consumer education, collective progress, and harmony-based values aligned with national development narratives. WWF remains more institutional and policy-oriented, while IFAW employs emotive storytelling and cultural symbolism to evoke empathy and moral reflection. Across both contexts, NGOs localize shared global goals through different repertoires of legitimacy, showing how transnational actors translate universal norms into nationally meaningful frames.

Migratory Flyways and Flexibility Among Alaska-Breeding Shorebird Species

Rosalyn Bathrick¹, Daniel Ruthrauff², Jim Johnson³, Nathan Senner¹

¹University of Massachusetts-Amherst, Amherst, MA, USA; ²Manomet Conservation Sciences, Anchorage, AK, USA; ³USFWS Mig Birds Program, Anchorage, AK, USA

Abstract:

Migration strategies among Alaska-breeding shorebird species are remarkably diverse, given the shared resources they rely upon during the nesting season in the arctic and subarctic. These differences in strategy, including flyway choice, departure timing, and

stopover frequency can expose species to distinct risks during migration. As shorebirds experience widespread population declines, it is increasingly important to understand how migratory species display flexibility that may support their ability to persist in a changing climate. Here, we use the southbound migration tracks of over 300 individuals from 16 shorebird species tracked from their breeding sites in Alaska to the southern extent of their respective ranges to investigate their migration strategies in a comparative framework. To maximize our ability to develop management objectives, we investigate two aims: (1) define the geographic limits of southbound shorebird flyways using dynamic time warp clustering and (2) characterize habitat change at stopover sites using remote sensing data. We predict that shorebirds using interior flyways, such as in the North American midcontinent, will exhibit greater spatial spread than along coastal flyways due to the increase in stopover options and the more rapid rate of landscape change. At the same time, we also predict that shorebirds using interior flyways will exhibit less temporal spread than those using coastal areas, which remain available throughout the migration window. Our approach will illuminate multi-species hotspots, areas of conservation importance, and the diversity of migration strategies across Alaska-breeding shorebirds.

Effect of Invasive Phragmites on Wetland Functioning

Anna Berg

Bradley University, Peoria, IL, USA

Abstract:

Phragmites australis is an invasive wetland plant that outcompetes native vegetation. The aim of this study is to understand the effect invasive Phragmites have on species and functional diversity of birds and plants. I hypothesize that functional richness, evenness, and divergence of vegetation and bird communities will be altered in areas invaded by Phragmites. I expect them to be lower than wetlands with no Phragmites. I will use the Passive Acoustic Monitoring approach to quantify species and functional diversity of birds in Phragmites-dominated and native plant-dominated habitats. I will use a multispectral drone to quantify the plant species and productivity at each site using NDVI as my metric for productivity. By quantifying the functional effects of Phragmites, we can understand the effect they have on ecosystem functioning and the urgency in mitigating the spread of invasive plants such as Phragmites.

Mapping Seasonal Fire Probability in Thailand Using Machine Learning

Enikoe Bihari^{1,2}, Karen Dyson¹, Kayla Johnston¹, Daniel Marc G dela Torre¹, Akkarapon Chaiyana¹, Karis Tenneson¹, Wasana Sittirin¹, Ate Poortinga¹, Veerachai Tanpipat^{1,3}, Kobsak Wanthongchai³, Thannarot Kunlamai¹, Elijah Dalton¹, Chanarun Saisaward¹,

Marina Tornorsam⁴, David Ganz^{1,4}, David Saah^{1,5}

¹Spatial Informatics Group, Pleasanton, CA, USA; ²Columbia University, New York, NY, USA; ³Kasetsart University, Bangkok, Thailand; ⁴Regional Community Forestry Training Center for Asia and the Pacific, Bangkok, Thailand ⁵University of San Francisco, San Francisco, CA, USA

Abstract:

Seasonal fires in Southeast Asia are a persistent conservation and public health concern, degrading forest ecosystems and polluting the air. In Thailand, a majority of wildfires result from escaped intentional burns from agricultural or forest commodity production, with ecological and economic feedbacks increasing the likelihood of future fires. These complexities make it difficult for Thailand's fire management organizations to empirically predict year to year fire probability and quantify the relative importance of its drivers. We present an operationally viable seasonal fire probability mapping method using a Random Forest machine learning model. We find that the highest fire probabilities emerge in forested and agricultural areas at mid elevations and near human settlements and roads, reinforcing our current understanding of the importance of anthropogenic drivers of fire in this region. Distinct areas of model uncertainty also occur in cropland and forests which are only burned intermittently, highlighting the importance of accounting for localized burning cycles. Variable importance analyses identify both natural and anthropogenic predictors as key and nearly equally important predictors of fire, including certain forest and crop types, vegetation characteristics, topography, climate, human influence and accessibility, water availability, and recent burn history. Our findings underscore the need for localized prevention and response strategies that are tailored to specific ecosystem and land use types. With our accessible Google Earth Engine workflow and application, we demonstrate the utility of machine learning and open-source tools for proactive fire management.

Structured Framework for Data-Driven Conservation Planning in Specialist Butterflies

Charlotte G Brennan¹, Chadwick D Rittenhouse¹, Shannon Kearney², Laura Saucier²

¹University of Connecticut, Storrs, CT, USA; ²Connecticut Department of Energy & Environmental Protection, Burlington, CT, USA

Abstract:

Conservation planning for rare specialist butterflies requires a structured approach that integrates detection, habitat assessment, and population ecology to identify opportunities for range expansion. Using *Callophrys irus* (Frosted Elfin) in Connecticut as a case study, we present a flexible, transferable framework to assess expansion potential with three integrated components: (1) capture-mark-resight surveys that

characterize abundance, dispersal, and fine-scale habitat use; (2) a tiered exploratory process that combines habitat modeling, vegetation assessments, and targeted occupancy surveys to expand large-scale distribution knowledge; and (3) a spatially explicit habitat expansion model that synthesizes habitat, distribution, and movement data to evaluate enhancement, restoration, and establishment opportunities around existing populations. The resulting management matrix translates modeled outcomes into actionable recommendations, offering a broadly applicable tool for advancing rare butterfly conservation across regions and taxa.

Investigating EEHV-HD Susceptibility in Young Elephants

Courtney Callagy¹, Natalia Prado^{1,2}

¹Adelphi University, Garden City, NY, USA; ²Smithsonian Conservation Biology Institute, Front Royal, VA, USA

Abstract:

Elephant endotheliotropic herpesvirus (EEHV) is a virus that greatly impacts the African (*Loxodonta africana*) and Asian (*Elephas maximus*) elephant populations as it can often be lethal to vulnerable calves. The virus attacks blood vessels, and weakens them to the point of rupture, resulting in hemorrhagic shock (EEHV-HD). Much is still unknown regarding EEHV, such as how immune responses may differ by individual calf, why some are able to survive and many others succumb to the virus, and the underlying mechanisms of susceptibility to developing lethal acute hemorrhagic disease. To investigate this, we aim to use bioinformatics methods to compare genomes between cases (individuals that died from EEHV-HD) and controls (individuals that survived) and ultimately identify potential genetic markers, or SNPs, that may be impacting immune function and increasing disease susceptibility. Elephant genomes were sequenced by scientists at the Center for Conservation Genomics at the Smithsonian Conservation Biology Institute. We will also be using PLINK, a genomic computing toolset, for further statistical and association analyses. This research is investigative in nature, and one of the first to explore the field of elephant health genomics. We hope to use our findings from this study to inform the management and care of zoo-housed elephants, help inform vaccine development, as well as apply them to their wild counterparts to improve conservation efforts and maintain robust, healthy populations of this important species.

Evaluating Acoustic Metrics as Proxies of Avian Diversity in the Peruvian Amazon

Ruzhuo Chen

Columbia University, New York, NY, USA

Abstract:

The Amazon rainforests harbor exceptional biodiversity but are increasingly threatened by habitat fragmentation and land-use change. Monitoring these changes remains challenging, as traditional field methods are labor-intensive and difficult to scale. Passive acoustic monitoring (PAM) has emerged as a promising alternative, but the extent to which acoustic metrics capture ecologically meaningful patterns remains uncertain, particularly given concerns about their ability to accurately reflect species diversity and community composition.

This study investigates how vegetation structure, habitat heterogeneity, and landscape fragmentation shape avian acoustic community patterns in a small-scale forest–agriculture mosaic in Madre de Dios, Peru. Autonomous recording units were deployed across an approximately 6 km² reforestation landscape comprising forest fragments, plantations, pasture, and crop fields. Acoustic data are used to quantify spatial and temporal turnover in avian acoustic diversity and community structure, and are linked to remotely sensed metrics of vegetation composition, structural complexity, and fragmentation within defined buffers around each sensor. In addition, bird point counts are conducted at each site to facilitate comparison with acoustic-derived metrics. By integrating acoustic monitoring with field-based observations and landscape analysis, this study aims to evaluate the strengths and limitations of PAM for assessing avian biodiversity in heterogeneous tropical systems and to inform the design of cost-effective biodiversity monitoring approaches for conservation management.

Does Habitat Fragmentation Increase Pathogen Load in Mouse Lemurs?

Anik Chhoker¹, Amanda K Rowe^{1,2}, Heather M Murphy¹, Travis S Steffens^{1,3}, Brigitte M Raharivololona⁴

¹University of Guelph, Guelph, Canada; ²University of Colorado Boulder, CO, USA; ³Planet Madagascar, Antananarivo, Madagascar; ⁴University of Antananarivo, Antananarivo, Madagascar

Abstract:

Madagascar is home to the most endangered mammal group in the world, the endemic lemurs, increasingly at risk of extinction due to habitat loss. In Northwestern Madagascar's Ankarafantsika National Park (ANP), fires used to promote cattle grazing have fragmented tropical dry deciduous forests, which serve as important lemur habitat, resulting in the isolation of lemur populations within increasingly small fragments. This decrease in fragment size may contribute to increased population density of lemurs in the short-term. It is unclear how this increase in lemur density may affect pathogen transmission amongst lemurs inhabiting smaller fragments. Therefore, the primary aim of this work is to test the density-dependent transmission hypothesis by investigating how human-induced fragmentation, and forest degradation affect pathogen

transmission between lemurs. I aim to understand how human-caused changes in fragment size and quality, landscape composition, and distance to human settlements affect lemur densities and fecal-oral pathogen prevalence. I will conduct my study at the Ambanjabe Field Site in ANP, Madagascar, between May and August 2026, focusing on the most widely distributed species, *Microcebus murinus* and *Microcebus ravelobensis*. To determine density, I will conduct nocturnal surveys and mark-recapture trapping procedures along preexisting transects within 20-25 fragments that vary in size, quality, and disturbance levels. To determine pathogen prevalence, I will sample feces opportunistically from live traps. Infectious disease remains poorly understood in primate ecology, and alongside habitat fragmentation, highlights the need for research on its impacts.

Drivers of Group Decline and Collapse: A Case Study from Monkeys in Kakamega Forest

Samantha Colah

Columbia University, New York, NY, USA

Abstract:

While population declines are well documented, the mechanisms driving group collapse in social animals, including primates, are poorly understood. A blue monkey (*Cercopithecus mitis stuhlmanni*) group in Kenya's Kakamega Forest provides a unique case. This group, formed in 2008 through a fission event, remained stable at approximately 10 individuals for seven years before declining over nine years. In 2025, the last adult female and four juveniles joined a neighboring group. This group's fate is unusual, as other nearby groups with similar initial sizes remained stable or grew, and overall the blue monkey population is stable. Rare group level collapses such as this provide an opportunity to understand the social and ecological factors that drive local extinctions, even in otherwise stable populations. This study examines potential drivers of decline from the monkeys' perspective, including the quality of their habitat and diet, their perceived risk of predation, survival of their infants, their fertility and birth rate, and strength of social bonds within the group. Using long-term individual-level behavioral observations and demographic records, I conducted a comparative analysis across small groups to explore how ecological and social processes influence group persistence and collapse. This study is the first quantitative assessment of group-level decline in blue monkeys. Findings are expected to provide new insights into why some groups collapse while others thrive and to inform conservation strategies for primates in increasingly human-modified forest landscapes.

A Hazard–Cost Framework for Bird-Window Collision Retrofits at Columbia University

Winston Qin, Avery Cotton, Dustin Partridge
Columbia University, New York, NY, USA
Abstract:

Bird-window collisions (BWCs) kill up to a billion birds each year in the United States, a leading cause of human-related bird mortality. Because birds perceive reflections in glass as sky or vegetation and often interpret transparent glass as open flight space, they fail to recognize windows as barriers. Retrofitting glass with dense decals or patterns can reduce collisions by over 90%. However, comprehensive retrofits may cost upwards of \$15/ft² of glass, making them prohibitively expensive for even well-endowed universities such as Columbia University, where prior monitoring from 2022–2024 has documented substantial BWCs. Therefore, institutions like Columbia must decide how to allocate limited retrofit budgets across multiple buildings to maximize total collision reduction. In this study, we quantify hazard variables drawn from the BWC literature—including glass area, maximum contiguous pane size, percent glass, window orientation, vegetation proximity and overlap, courtyard enclosure, fly-through geometry, and nighttime light emission measured from perspective-corrected imagery—across buildings with high collision counts. We then relate these variables to recorded collision counts to identify the building features most strongly associated with BWC abundance at Columbia and use these results to develop a ranked retrofit strategy that incorporates direct financial costs, social costs of witnessed collisions, and ecological costs of bird mortality. This framework provides Columbia—and, by extension, other urban institutions—with a scalable method for allocating retrofit funds where each dollar yields the greatest reduction in bird mortality.

Floristic Diversity of an Overlooked Salt Marsh in Westchester County, New York

Julie D'Onofrio
Lehman College, New York, NY, USA
Abstract:

A floristic survey of Marshlands Conservancy, the largest remaining salt marsh complex in Westchester County, is nearing completion for its second year of field investigation. The objectives of this study are to document the vascular plant diversity of this coastal system and evaluate its conservation significance in the context of accelerating sea-level rise associated with climate change. Field surveys encompass rocky shorelines, maritime shrublands, brackish transitional habitats, and high and low salt marsh communities. Current findings are being compared with herbarium collections made in 2001 by Ian MacDonald and with recent observations from the iNaturalist project

“Marshlands Conservancy Biodiversity Survey.” This work reveals a substantially richer vascular flora than previously documented for the site, including multiple state-listed taxa classified as critically imperiled, imperiled, or rare in New York. Several taxa represent new records for Westchester County, demonstrating that this ecologically significant site has been historically under-surveyed. Voucher specimens are being collected with associated data on habitat, abundance, and co-occurring vegetation for deposition in institutional herbaria to ensure permanent documentation. This work establishes an important floristic baseline for one of the region’s most significant tidal marsh systems and provides a framework for long-term monitoring, conservation planning, and comparison with nearby salt marshes. Continued floristic inventory at well-known sites remains critical, as demonstrated by the persistence and previously undocumented occurrence of rare plants within a highly altered suburban landscape.

Proceeding with Sound Judgment: Applied Sensory Ecology

Julia N D Daniell

University of Vermont, Burlington, VT, USA; Gund Institute for Environment, Burlington, VT, USA

Abstract:

Anthropogenic sound has expanded rapidly across natural landscapes, with outdoor recreation emerging as a major and growing source of noise on public lands. Despite increasing recognition that noise pollution can affect wildlife behavior, distribution, and ecosystem functioning, the auditory impacts of recreation are rarely studied independently from other forms of human disturbance. This gap limits the ability of land managers to predict wildlife responses and to balance biodiversity conservation with recreational access.

Building on prior work in the Bridger-Teton National Forest (Wyoming, USA), this research employed a controlled field experiment across twelve sites during peak recreation seasons (2024–2025). Motion-triggered cameras and scheduled auditory playback systems were used to broadcast natural, non-motorized, and motorized recreation sounds at varying exposure rates. By isolating sound from other recreational stimuli, the study assessed whether repeated exposure led to habituation and whether responses differed by recreation type and playback frequency. Wildlife responses were evaluated through changes in relative abundance and activity patterns. In addition to the empirical investigation, this presentation will touch on potential soundscape indicators—such as noise-free intervals, sound exceedance levels, wildlife presence deviation, and spatial recreation metrics—to support long-term monitoring and adaptive management of acoustic environments in wildlands and wilderness areas.

From Fragmented to Near-Complete: Conservation Genomics of the Spoon-billed Sandpiper

Rachel Davis¹, Erik Enbody¹, Fyodor Kondrashov²

¹Cornell University, Ithaca, NY, USA; ²Okinawa Institute of Science & Technology, Okinawa, Japan

Abstract:

With only 400–500 adults remaining globally, the critically endangered spoon-billed sandpiper (*Calidris pygmaea*) continues to decline at 5-10% per year, flagging an imminent extinction vortex fueled by genetic diversity loss. Genomic resources essential for conservation management of this species are outdated and highly fragmented, with the most recent public assembly released in 2018. Accurate assessment of inbreeding and subtle population structure in a rapidly shrinking population requires a more contiguous reference genome. To address this, we generated a substantially improved genome assembly and conducted the first population genomic analysis of modern spoon-billed sandpipers sampled from the remote breeding population and chick headstarting program of Meinypil'gyno, Russia (n = 44). Using Oxford Nanopore sequencing (44 Gb; ~37× coverage) and the long-read Flye assembler, we produced a 1.18 Gb genome with a contig N50 of 17.8 Mb, outperforming other reference genome candidates. Using this assembly, we detected weak population structure and heterogeneous inbreeding ($F_{ROH} \approx 0.00-0.16$), with long runs of homozygosity revealing recent autozygosity in a subset of birds, but not limited to only captive-reared birds. This work establishes a transferable framework for data-driven management of genetic diversity in critically endangered species undergoing captive rearing, reintroduction, and non-random mating, an increasingly common challenge in wildlife conservation programs.

Tuning in to Spotted Lanternfly Vibrational Communication for Conservation

Ke Coco Deng, Bekka Brodie, Malcolm Rosenthal

Columbia University, New York, NY, USA

Abstract:

The rapid spread of invasive spotted lanternflies (SLFs, *Lycorma delicatula* (White 1845)) poses a unique threat to forests and agriculture. SLF sap feeding both directly damages trees and produces honeydew which attracts sooty mold. Current SLF management often relies on chemical controls or physical traps which also harm native insects. Targeted management strategies require understanding the behavioral mechanisms that facilitate SLF life history, which remain poorly understood. This study

investigates the role of a recently identified mechanism, substrate-borne vibrational communication, in the SLF life cycle. I will define the temporal and spectral characters of vibrations and the behavioral contexts in which they are produced by integrating field observations and piezo-disc contact recordings, and using playback to determine responses to vibrations. I will apply these methods to individuals at multiple life stages (juvenile instars, fresh adults, courtship, egg laying). Furthermore, I will examine how these signals vary between urban and rural landscapes to determine if anthropogenic noise or structural differences influence signal evolution and invasion success. My goal is to collect fundamental behavioral knowledge which contributes to SLF-specific, low-environmental-impact management strategies such as innovations in trapping methods using vibrational lures. Fieldwork will be conducted in summer 2026; results will be discussed.

Ethnobotanical Educational Experiences and Their Effect on Plant Awareness Disparity

T Michael Dodson^{1,3}, Patrick Kirby², Danielle Cotton³, Rachel Gisewhite³

¹Mississippi University for Women, Columbus, MS, USA; ²Pennington Biomedical Research Center, Baton Rouge, LA, USA; ³University of Southern Mississippi, Hattiesburg, MS, USA

Abstract:

Human-induced habitat loss and the loss of biodiversity may stem in part from Plant Awareness Disparity in which people have lost their awareness of the unique role plants play in the ecosystem and to human lives. Botany as a subject has been taught separately from the rest of biology for hundreds of years, but in more recent history, this emphasis on botanical knowledge has waned when compared with the increase in other forms of scientific knowledge potentially leading to university students not entering college with much botanical knowledge. Plant relevance, such as ethnobotanical plant uses, in human lives may be directly related to a lack of plant awareness.

Ethnobotanical surveys are more commonly done with indigenous groups seeking to preserve and record traditional knowledge from these communities. These studies tend to look for medicinal or other plant-use knowledge. To a lesser extent, ethnobotanical surveys seek to find ethnobotanical knowledge in broader populations, and in those cases, it is more often focused on rare plant value. Seeking knowledge across broad groups is necessary to find trends and elucidate gaps in knowledge, so investigating ethnobotanical knowledge of a large group in Mississippi that has not previously been evaluated can be useful in targeting ways to increase plant awareness and conservation in broad populations. This study investigated the current level of ethnobotanical knowledge by conducting the first ethnobotanical assessment in Mississippi of a

college-student population, how this compares to their plant awareness, and how that knowledge is transferred from one individual to another.

Semantic Variation between Academic and Indigenous-grounded Conservation

Aaliyah Roberts^{1,2}, Dora Donacik³, Ryan A Wagner³, Joshua Drew³

¹Syracuse University, Syracuse, NY, USA; ²Florida Atlantic University, Boca Raton, FL, USA; ³SUNY College of Environmental Science and Forestry, Syracuse, NY, USA

Abstract:

Conservation Biology is an integrative, multidisciplinary, crisis-driven field that benefits from collaborations between institutionalized academic ecological knowledge (AEK) and practitioner-led traditional ecological knowledge (TEK). Conservation Biology is made whole through the thoughtful integration of academic and traditional ecological knowledge. Through this project, we aim to identify epistemological barriers to equitable collaborations between TEK and AEK. We examined terminology, impact factor, degree of local involvement, and epistemological differences between academic and Indigenous-led conservation approaches. Search results were compiled across three different databases (Google Scholar, Directory of Open Access Journals, and Web of Science). Keyword analysis revealed semantic differences between TEK-based and AEK-based papers, where TEK papers tended to emphasize quantitative data while AEK-based papers had more semantic association with people and communities. In assessing the impact factor, TEK-based papers tended to be published in journals with a higher impact factor than AEK-based papers. Surprisingly, we found very little overlap in the search results returned by the three databases used to conduct the literature review, and both the impact factor and local involvement scores differed between databases. We recommend that (a) Conservation Biology researchers prioritize an active collaboration between academic and Indigenous knowledge holders, (b) integrate a diverse profile of databases for literature review, and (c) encourage more open-access journal submissions to increase community engagement.

Evaluating Forest Dynamic Changes After Beech Leaf Disease

Taylor Drabick¹, Andrew B Reinmann², Matthew I Palmer¹

¹Columbia University, New York, NY, USA; ²The City University of New York, New York, NY, USA

Abstract:

In the eastern U.S., the American beech (*Fagus grandifolia*), an often-dominant canopy species, occupies 27.4% of total forest area, sequestering carbon and influencing light availability and understory composition. Beech Leaf Disease (BLD) is an emerging

threat to these forests. Symptoms include scattered striping and curling of leaves that can result in branch dieback, canopy thinning, and eventual death. Exact mechanisms of BLD spread are not known, and no approved curative treatment is available. Considering projected declines of beech in the coming decade, understanding the drivers of forest condition after beech loss will be crucial. Habitats with high disturbance levels prior to a BLD outbreak are more likely to have existing understory invasive plant species populations. The establishment and spread of invasive species is context-specific, changing with environmental conditions and propagule pressure. Beech stand vegetation surveys were conducted across 35 plots between NYC and the Catskill mountains, encompassing an urban-to-rural gradient, varied soil types, and canopy composition. Vegetation surveys providing detailed abundance data on invasive species populations will identify the invasive species population dynamics representing the greatest forest biodiversity recovery threats. GIS landscape analysis for a suite of environmental variables will identify drivers of post-outbreak vegetation patterns. In particular, we will identify combinations of environmental and vegetation conditions that represent the greatest challenges to forest recovery following BLD outbreak, providing recommendations to support disease-adaptive forest conservation and management.

Multi-scale Migratory Habitat Selection of Long-eared Owls in North America

Evan C Drake^{1,2}, Tyler Christensen^{1,3}

¹Wild Bird Research Group Inc., Pennington, NJ, USA; ²Felician University, Lodi, NJ, USA;

³Pinelands Commission, Pemberton Township, NJ, USA

Abstract:

Migration is an important life history event of certain birds during which they must select resources in transit. The study of habitat selection during migration is difficult for smaller birds due to weight restrictions of GPS transmitters. The relatively poorly-studied Long-eared Owl is an example of a species whose migrations have only recently been feasible to describe. We used migration data from 9 owls over three years to provide the first description of their stopover site selection during their spring migration northward. We examined selection at the site- and landscape-scales by comparing used points to simulated migration paths thought to be available to owls. Our results show that Long-eared Owls strongly prefer wetlands at multiple spatial scales. Our models also agreed with previous studies of selection showing that owls prefer to roost in evergreen, rather than deciduous, forests that are in close proximity to shrublands. Owls also avoided sites with high percentage of urban areas and closed-canopy forests in the surrounding landscape. Our work represents the first study of Long-eared Owl migration using GPS transmitters.

Urbanization Alters Dynamics of Tick-Borne and Intestinal Parasite Infections

Alyssa Dunn, Maria Diuk-Wasser, Viorel Popescu

Columbia University, New York, NY, USA

Abstract:

Zoonotic diseases that transmit between animals and humans present a growing challenge to both public health officials and urban conservationists. However, the ecological drivers of multi-pathogen dynamics in urban landscapes remain understudied. Research shows that simultaneous infections, or coinfections, present critical health issues by worsening outcomes and increasing host susceptibility. Understanding pathogen-host dynamics is also vital for informing safe and effective natural area conservation in fragmented urban environments. Our study evaluated the effects of urbanization on the relationship between three zoonotic tick-borne infections: Lyme disease, Babesiosis, and Anaplasmosis, and the intestinal parasite raccoon roundworm. We focused on the white-footed mouse, which is the reservoir for tick-borne infections and an intermediate host of raccoon roundworm. We also assessed the community of ticks as disease vectors and raccoons as roundworm definitive hosts. Our study analyzed host community structure, urbanization landscape metrics, and infection prevalence across New York City. We found that suburban areas with a mix of natural and developed land exhibited increased coinfection prevalence, and that roundworm infection correlated with increased prevalence of coinfection with tick-borne pathogens. Our results show that landscape and host/pathogen community structure are important drivers of coinfection. These results can be integrated into infection risk maps that inform wildlife management and habitat design strategies that protect biodiversity in urban green spaces while minimizing disease transmission.

Machine Learning Detects Native Oak Preference by Gall-forming Arthropods

Liam D Engel¹, Emily M Herstoff², Evon Hekkala^{1,3}, Damon P Little^{4,5}, Michael

Tessler^{3,4,5,6}

¹Fordham University, Bronx, NY, USA; ²St. Francis College, Brooklyn, NY, USA;

³American Museum of Natural History, New York, NY, USA; ⁴New York Botanical Garden, Bronx, NY, USA; ⁵Graduate Center, City University of New York, New York, NY, USA; ⁶Medgar Evers College, Brooklyn, NY, USA

Abstract:

Native plants generally support greater biodiversity than non-native plants, especially for specialist taxa like gall-forming arthropods. Some woody plants, particularly oaks (*Quercus* sp.), are known to have high gall-forming arthropod richness. Galls of these

arthropods are indirectly preserved on herbaria specimens, with plant identifications often performed by taxonomic specialists. In the last two decades, many herbaria specimens have been digitized and uploaded to large, global databases like GBIF. Technological advances in machine learning, a subfield of artificial intelligence, allow for rapid image processing, especially for standardized images such as herbarium plant specimens. We will train a convolutional neural network (CNN) to recognize galls on over 200 years of digitized oak leaf specimens from herbaria in North America and Europe to determine whether native oak trees host greater abundance of galls than non-natives across both space and time. We predict galling arthropods will exclusively utilize the native *Quercus*, and this will not change across temporal records. Our study advances the use of artificial intelligence in large-scale conservation efforts and our understanding of the effect that non-native trees have on local biodiversity.

Biogeophysical Signatures of Natural Attenuation at a Legacy Oil Spill Site

Nicolette Filippone¹, Dimitrios Ntarlagiannis¹, Estella Atekwana², Silvia Roszbach³, Megan Parsell³, Lee Slater^{1,4}

¹Rutgers University Newark, Newark, NJ, USA; ²University of California-Davis, Davis, CA, USA; ³Western Michigan University, Kalamazoo, MI, USA; ⁴Pacific Northwest National Laboratory, Richland, WA, USA

Abstract:

Hydrocarbon biodegradation is thought to alter subsurface environments chemically, physically, and geophysically, but links to geophysical signals are not fully understood. At the Bemidji, MN crude oil site, we combine field Electrical Resistivity Imaging (ERI) and Spectral Induced Polarization (SIP) surveys with lab column and magnetic susceptibility (MS) measurements to explore how biodegradation may influence subsurface electrical properties. Conductivity anomalies occur within the smear zone and shift with the water table, consistent with ion rich pore fluids from microbial organic acids, mineral weathering, and redox cycling. We also observe a linear relationship between chargeability (M) and MS, suggesting electron conducting minerals, potentially magnetite from microbial Fe(III) reduction, contribute to induced polarization via charge storage at mineral pore fluid interfaces. Depth resolved 16S rRNA microbial community data, with Fe concentrations (XRF, Ferrozine) and MS along the core, show composition shifting from *Rhodospirillum rubrum* dominated shallow depths to *Pelotomaculum* dominated depths, with transient *Geobacter* and *Desulfosporosinus* peaks at redox transitions broadly coinciding with Fe enrichment and elevated MS, consistent with localized biomineralization, while other depths point to additional controls on MS. Field ERI transects from 2010 and 2024 show similar conductivity patterns. These results suggest SIP and MS are complementary indicators of microbial iron biomineralization,

highlighting the value of integrating geophysical and geochemical methods for monitoring bioremediation.

Soil Microbial Communities Under the Influence of Urban Pavement Removal

Lily Fillwalk, Ming-Yi Chou, Stephanie Murphy, Jason Grabosky

Abstract:

In cities, there has been a large push recently to 're-wild' areas, ultimately increasing green infrastructure. To achieve these goals, grey infrastructure (i.e., asphalt) is often removed, revealing a previously sealed soil. While these soils are often exposed, little is known about the microbiology. At Rutgers University, a unique landscape architecture project is underway, re-greening an area and removing a decades-old paved road. To explore the sealed soil, soil was sampled a day after pavement removal and at various intervals thereafter. Regarding methodology, we conducted both community-level physiological profiling (CLPP) and 16S rRNA amplicon sequencing. Using the CLPP, Biolog's EcoPlate technology was used to assess the metabolic activity and carbon source utilization of the soil samples. Preliminary results indicate a shift in the soil microbial activity since pavement removal. Currently, a Miyawaki-style forest is being implemented at the research site, comprising 3,000 native tree species. The Scoop & Dump method of soil profile rebuilding was also used to decompact the soil and introduce compost, right before the afforestation. Further monitoring of this site will continue for years to come to better understand the ecology of the urban transition from grey to green infrastructure.

Demographic History to Evaluate Management Options of West African Crocodiles in Chad

Corwin Freedman¹, Seth Cunningham², Katy Rush¹, Haley Arbon¹, Elsa Bussiere¹, Evon Hekkala^{1,2}

¹Fordham University, Bronx, NY, USA; ²American Museum of Natural History, New York, NY, USA

Abstract:

The West African Crocodile (*Crocodylus suchus*) is a recently recognized species of African crocodile. Once found across much of northern Africa and the Sahara Desert including Egypt, *Crocodylus suchus* has experienced a major range contraction with the last specimen from the Nile river basin collected during the 1920s. This study used a Pairwise Sequentially Markovian Coalescent model (PSMC) to evaluate the historical and ancient demographic histories of two unique remnant populations. One population is found in a large protected area historically connected via large water bodies and

seasonal flooding to other basins, while the other is a remote isolate found in an oasis in the Ennedi Plateau in Central Chad. The goals of this study were to gain a better understanding of how ancient and historical impacts from climate change and the past century of anthropogenic land use change have effected *Crocodylus suchus* population levels across its distribution and to assess the baseline population size of an at-risk isolated population under consideration for a translocation of individuals to maintain breeding.

Seasonality, African cherry, and threats shape Mount Cameroon Francolin distribution

Francis Guetse*, Simon Awafor Tamungang, Taku Awa II, Francis Luma Ewome, Francis Njie Motombi, Jan Riegert and David Hořák

Abstract:

Understanding habitat preferences is essential for effective conservation, particularly for threatened species. The Mount Cameroon Francolin (*Pternistis camerunensis*) is a globally threatened bird endemic to Mount Cameroon, facing both natural and human pressures, yet its ecology and distribution remain poorly understood.

We examined the effects of environmental variables—including vegetation structure, elevation, season, tree cover and loss, key tree species abundance, and human disturbance—on Francolin occurrence and group size. Surveys were conducted in July 2016, July 2021, February and July 2022 at 240 sampling points along an elevational gradient (800–2500 m a.s.l.). Francolins were surveyed using playback-assisted point counts (300 m radius), and vegetation structure was assessed within 50 m. Occurrence increased significantly with the abundance of African cherry (*Prunus africana*) and declined where it was absent. Human disturbance, particularly hunting, significantly reduced both occurrence and group size, with Francolins absent from sites containing traps. Occurrence was higher in the dry season than in the wet season, with similar patterns for group size. Data from 2022 also showed higher occurrence and larger group sizes at higher elevations. These findings highlight the importance of key habitat features and the negative impacts of human disturbance. Ongoing forest loss, habitat degradation, and hunting pressure likely threaten this range-restricted species, underscoring the need for targeted conservation actions.

Muskrat Biomimicry - New Marsh Bird Conservation Tool?

Leo Chan Gaskins

University of Chicago, Chicago, IL, USA

Abstract:

By developing techniques to incorporate positive species interactions into ecosystem restoration, we can use ecological theory to advance on-the-ground conservation efforts. Muskrats are ecosystem engineers that alter wetlands by building lodges, which generate clearings in vegetation. My observational data show an 8-fold increase in animal abundance on muskrat lodges vs. vegetated controls, with most of the animals being marsh birds. This suggests that muskrats generate a powerful positive species interaction by building lodges and increasing habitat complexity. Unfortunately, muskrat populations are in decline, with muskrat lodge counts dropping by over 90% in some regions. Therefore, I created a novel technique to build mimic muskrat lodges, and ran a large-scale manipulative experiment to test if these can harness this positive species interaction and be used to improve marsh bird conservation efforts.

Radiation in Fish Specimens from the Marshall Islands

Ann Marie Gawel, Paula Azul Ayala, Nova Bryen, Aongkita Biswas

American Museum of Natural History, New York, NY, USA

Abstract:

Between 1946 to 1958, the U.S. conducted 67 nuclear tests at Bikini and Enewetak Atolls in the Marshall Islands. This radiation affected the residents, their food sources, and their environment. Operation Crossroads was a Navy project that consisted of the first two nuclear tests at Bikini Atoll in 1946 and included a scientific expedition that collected fishes because these were important food sources for residents. Over two hundred fish specimens were sent to the American Museum of Natural History's (AMNH's) Ichthyology Department. We looked at these specimens to learn more about the species and to test whether they still contain trace amounts of radioactivity. We went through the AMNH database and categorized fishes from the Marshall Islands according to their trophic levels, and whether they are food fishes. We then honed in on species of interest across these categories to request from AMNH Ichthyology, and we used a Geiger counter to detect counts per minute for each specimen. Specimens were collected indiscriminately during Operation Crossroads. Small predators and herbivores were the two most common types of fishes, and most fish species in these collections are fished for food, but many are not considered food. We did not detect any radiation from fish specimens above background levels. All dosimeter readings remained low, between 10 and 34 counts per minute (0.07 - 0.23 microsieverts/hour), with no significant differences between specimens collected before, or after bombings, nor between those and our neutral readings. Our results so far indicated that these specimens do not emit concerning radiation, and thus far have not identified any radioactive isotopes.

Pollution Impacts on Largemouth Bass Diet in Onondaga Lake

Greene, Audreanna, Joshua Drew, Cassidy Murphy

SUNY College of Environmental Science and Forestry, Syracuse, NY, USA

Abstract:

Onondaga Lake, located in Syracuse NY, has had a long history of pollution following the dumping of industrial waste and sewage discharge for over a century. Our research examined the impacts of pollution on the Largemouth Bass (*Micropterus nigricans*) populations in Onondaga Lake. Over the summer of 2026, seining and trap-netting techniques were used to catch the Largemouth bass, and then the length, weight, and gape size were measured for each fish. The fish's gut contents were analyzed via gastric lavage and prey's potential to bio magnification of mercury was evaluated. Here we show length-weight relationships and gape size as well as diet type, including invasive species, such as Round Goby. The results will provide important insights into the change in diet of the large mouth bass over time as a response to pollution levels.

Cottonwood and Willow Tree Health in a Disturbed Urban Riparian Ecosystem

Katherine Hade, M Shane Heschel

Colorado College, Colorado Springs, CO, USA

Abstract:

Riparian woodlands significantly support biodiversity and are under increasing threat in Colorado, USA, due to significant habitat loss and anthropogenic disturbance. With riparian biodiversity coming under increased threats from urbanization, diversity monitoring might be prioritized and the study of keystone species may be an indirect and more accessible method to assess riparian biodiversity. *Populus deltoides* and *Salix amygdaloides*, two keystone species, were studied before and after the introduction of road disturbance on an urban riparian ecosystem, Mesa Creek, in Sondermann Park, Colorado Springs, Colorado, USA. Data collection occurred in ten study sites along Mesa Creek using a modified line transect method. We measured creek dissolved oxygen content (mg/L), light quality (R:FR), light quantity (fc), and tree health. We observed negative impacts of road disturbance on the riparian ecosystem through a decline in tree health and creek dissolved oxygen content (mg/L), especially in sites closer to the new road. *Populus deltoides* may be more impacted by disturbance than *Salix amygdaloides* as we observed possibly greater canopy damage and higher mortality rates with *Populus* following road construction. Our findings support the greater need for research on the effects of road disturbance on tree health and water chemistry in riparian ecosystems.

Noninvasive Molecular Methods for Detecting Flying Squirrel Species in Pennsylvania

Ahmad Harraz, Jeffrey Klemens

Thomas Jefferson University, Philadelphia, PA, USA

Abstract:

Accurate detection methods are essential for monitoring elusive wildlife species. This project uses a newly developed DNA assay to support detection of southern flying squirrels (*Glaucomys volans*) and northern flying squirrels (*Glaucomys sabrinus*) in Pennsylvania, including in areas where *G. sabrinus* historically occurred but has not been recently detected. As visual identification using camera trap images at bait stations may be insufficient for distinguishing between these species, this study focuses on molecular confirmation using non-invasive stool and saliva samples collected from handled food items. We used two primers, a universal mammal primer and a novel, *Glaucomys*-specific primer pair designed to amplify DNA from flying squirrels while excluding other mammals observed at the bait stations. By integrating molecular confirmation with field observations, this work may improve detection reliability and provide a useful tool for future conservation and monitoring efforts of *G. sabrinus*, an endangered species in Pennsylvania.

Multivariate Analysis of Survival Factors in the Reintroduced Bengal Slow Lorises

Sabit Hasan^{1,2}, Shoeb Ali², Tania Akhter², Mohammad Abdur Rahim², Khalid Mushwan², Mofaqkharul Islam², Toufique Ahmed², Safayat Hossain², Tanvir Ahmed³, K A I Nekaris⁴, Habibon Naher⁵, Luca Pozzi¹, Sabir Bin Muzaffar⁶

¹The University of Texas at San Antonio, Texas, USA; ²Isabela Foundation, Dhaka, Bangladesh; ³Leibniz Institute for Primate Research, Göttingen, Germany; ⁴Anglia Ruskin University, Cambridge, UK; ⁵Jagannath University, Dhaka, Bangladesh; ⁶United Arab Emirates University, Abu Dhabi, UAE

Abstract:

Asian slow lorises are widely traded animals, leading to numerous confiscations of live specimens. These individuals are often reintroduced to wild habitats without considering ecological constraints, social dynamics, health checks, vulnerability to disease, or post-release survival monitoring. Such unmanaged releases may be as deadly and potentially lead to recapture by poachers or high mortality rates. Hence, we analyzed media reports published between March 2015 and April 2024 to evaluate the incidences of illegal trading, rescue operations, and relocation efforts concerning the Endangered Bengal slow loris (*Nycticebus bengalensis*). About 59% of lorises were found in poor health condition, 14% were electrocuted, and 27% were confiscated during illegal trade. To measure the survival and adaptation, we tagged and tracked seven

reintroduced lorises using radio collar transmitters. We collected their behavioral data from dusk to dawn using focal sampling in two northeastern forest patches from May 2023 to May 2024. Studies suggest survival in a new habitat is correlated with multiple factors: distance of release location from the captured sites, pre-release health condition of the individual, density of lorises in the release habitat, territoriality, and resource availability. Finding a good pocket in a new habitat might save reintroduced individuals from certain death. The study suggests insights for setting rehabilitation guidelines and a new conservation approach.

The Return of Beavers to the Bronx River: Camera Traps Reveal Urban Biodiversity

RJ Hawkins

Wildlife Conservation Society, New York, NY, USA

Abstract:

North American beavers (*Castor canadensis*) were once abundant throughout New York City but were extirpated following European colonization. From 2007–2018 two beavers inhabited the Bronx County section of the Bronx River, representing the first documented return of the species to New York City in over 200 years. Since 2018, however, beavers have been absent from this urban river system. To evaluate current biodiversity and assess conditions for potential beaver recolonization, camera traps were deployed along the Mitsubishi Riverwalk adjacent to the Bronx Zoo from June–October 2024 and April–December 2025. Cameras were positioned upstream and downstream of the Twin Dams to compare wildlife activity across habitat conditions. In 2024, no beavers were detected, but the cameras recorded a diverse assemblage of species including coyotes and great blue herons. Species richness was consistently higher upstream of the dams, suggesting that the impoundments create wetland-like habitats that support greater biodiversity. In 2025, a beaver was documented on three separate occasions between May and November, accompanied by multiple observations of tree-chewing activity, indicating renewed presence and interaction with the riparian environment. These findings highlight the ecological importance of habitat complexity in urban waterways and suggest that sections of the Bronx River remain capable of supporting keystone ecosystem engineers. This study discusses the implications of these observations for urban river restoration, including the potential role of beaver dam analogs and coexistence strategies to balance biodiversity conservation with river connectivity and urban management.

Conservation as Value Signals: “Wildness” in Croaker Aquaculture in China

Zhihan He

Yale University, New Haven, CT, USA

Abstract:

The large yellow croaker (*Larimichthys crocea*) has been incorporated into large-scale aquaculture production since the early 2000s. Once largely depleted by overfishing in China, its wild stock was classified as Endangered (EN) by the International Union for Conservation of Nature (IUCN) in 2009. Conservation discourses, on the one hand, impose restrictions through fishing bans for protection and, on the other, signal the inaccessibility and distinctive qualities of wild fish, rendering wild large yellow croaker a highly valued delicacy in informal markets. This project examines how farmers produce “semi-wild” large yellow croaker through everyday practices such as breed selection, feeding, medical treatment, and classification. I conducted two months of participant observation and interviews while living day and night on floating aquaculture platforms where farmers also reside, in coastal Fujian. This research shows how aquaculture transforms marine uncertainty into controlled commodities while producing market-readable signals that align with conservation discourses, such as color, freshness, and perceived wildness. This research contributes to anthropological approaches to marine conservation by demonstrating how conservation discourses generate market signals that shape both production practices and consumption in food systems.

Edge Effects and Canopy Heat: Insights from Thermal Drones in the Tropics

Skye Hellenkamp¹, Leonardo Maracahipes-Santos², Paulo Brando¹

¹Yale University, New Haven, CT, USA; ²Instituto de Pesquisa Ambiental da Amazônia, Canarana, MT, Brazil

Abstract:

Tropical forests worldwide are increasingly under stress from deforestation and degradation. As forests are converted into agricultural land, the landscape becomes hotter and drier with the loss of evapotranspiration from trees. In the southeastern Brazilian Amazon, large-scale industrialized agriculture has fragmented forests, leaving a mosaic of forest patches with edges exposed to harsh adjacent microclimatic conditions. Edge effects within these forests have been shown to decrease biodiversity and carbon storage, and increase tree mortality and fire susceptibility. In this analysis, we examine tree canopies, largely responsible for the exchange of carbon and water fluxes, from a thermal remote sensing perspective. Using thermal drone sensors, we mapped an edge-to-interior gradient to examine edge effects from an aerial perspective. Tree canopy temperatures can serve as a proxy for evapotranspiration, providing insight into how trees distributed along the edge-to-interior gradient are cycling water. During the annual dry season, trees often rely on deep-rooted access to water, and understanding their water-use strategies can offer a better understanding of forest

resilience under heat and drought stress. Ultimately, quantifying these fine-scale thermal gradients is essential for understanding how edge-driven microclimatic changes scale up to influence the overall climate-buffering capacity and long-term stability of fragmented landscapes facing increasing environmental pressures.

Dispersion and Neighborhood Co-occurrence of Pocillopora Corals at Rapa Nui

James J Herlan^{1,2,3,4}, Sarah A McTague⁵, Phillip PA Staniczenko^{2,6}, Ji Meng Loh⁷, Rolando Santos⁸, W Ryan James⁸, Art CR Gleason⁹, Clinton B Edwards⁵, J Stephen Gosnell^{2,10}, Kyle C McDonald^{2,4}, Alan M Friedlander^{11,12} Carlos F Gaymer¹

¹Universidad Católica del Norte, Coquimbo, Chile; ²The Graduate Center-City University of New York, New York, NY, USA; ³NOAA EPP Earth System Sciences and Remote Sensing Scholar, New York, NY, USA; ⁴City College of New York-City University of New York, New York, NY, USA; ⁵University of California-San Diego, La Jolla, CA, USA; ⁶Brooklyn College-City University of New York, Brooklyn, NY, USA; ⁷New Jersey Institute of Technology, Newark, NJ, USA; ⁸Florida International University, Miami, FL, USA; ⁹University of Miami, Coral Gables, FL, USA; ¹⁰Baruch College, City University of New York, New York, NY, USA ¹¹University of Hawai'i at Manoa, Kāne'ohe, HI, USA; ¹²National Geographic Society, Washington DC, USA

Abstract:

The dispersion of reef-building corals reflects biological and physical processes that structure benthic habitats, yet the threshold at which compositions of benthic reef habitats shift due to disproportionate effects wave exposure remain poorly resolved. We addressed this question at Rapa Nui (Easter Island), an isolated subtropical reef where stress-tolerant *Porites* and opportunistic *Pocillopora* co-dominate across a pronounced wave exposure gradient. We surveyed three reef sites using large-area imagery to examine *Pocillopora* dispersion at each site with variance-to-mean ratios, spatial point pattern model comparison, and neighborhood co-occurrence analysis. Our results revealed a non-monotonic pattern reflecting competing influences of competitive constraint and physical disruption: clustering intensity was strongest at the moderately wave-exposure west reef, intermediate at the wave-sheltered north reef, and lowest at the highly exposed southeast reef. At the north and west reefs, *Pocillopora* dispersions were consistent with biotic clustering, habitat suitability, or both; neighborhoods were dominated by *Porites* tissue, indicating that *Porites* competitive dominance constrained *Pocillopora* to isolated refugia within a dense reef matrix. At the exposed southeast reef, only spatial models incorporating substrate heterogeneity provided adequate fits, and *Pocillopora* neighborhoods were dominated by basaltic substrate which consistent with opportunistic colonization of a chronically-disturbed habitat. By integrating dispersion and co-occurrence analyses, we revealed structuring

mechanisms and interaction contexts that affect reef resilience along environmental gradients.

Recovery of Harbor and Grey Seals in an Urban Marine Ecosystem: A 15-Year NYC Study

Kristy Houskeeper^{1,3}, Tor Alvey^{2,3}, Ian Lopez^{2,3}, Kristy L Biolsi^{2,3}, Kevin L Woo^{1,3}

¹SUNY Empire State University, Selden, NY, USA; ²Marist College, Poughkeepsie, NY, USA; ³Center for the Study of Pinniped Ecology & Cognition (C-SPEC), Selden, NY, USA

Abstract:

The presence and absence of species in a community is an important indicator of ecological health over time. To that extent, population decline of pinnipeds in the New York City (NYC) region was historically and likely correlated with increased anthropogenic activities, such as rapid industrialization and pollution of the marine ecosystem. This past local extinction of pinnipeds has been changing, and the public began to report anecdotal sightings of pinnipeds within the NYC waterways. We have been conducting a longitudinal study based on naturalistic observations of harbor seals (*Phoca vitulina*) and grey seals (*Halichoerus grypus*) since 2011, focused on two main locations: Orchard Beach and Swinburne Island. We previously reported demographic data during the wintering months of 2011-2017 (Woo & Biolsi, 2018) and now describe additional data collected through the 2025-2026 field season. Here we report our monitoring of the demographic trends in which we found that seasonal populations continue to be relatively stable and consistent from year-to-year yet indicate a slight increasing trend. The results are encouraging and demonstrate that pinnipeds have in fact returned to a previously inhabited niche. We also report data on environmental conditions that correlate with the numbers of seals hauled out at these locations. The increased presence of pinnipeds may serve as a bioindicator of ecosystem health, with implications for species that are also interdependent in the trophic food web. Despite continued anthropogenic activities, increasingly positive environmental conditions seem to favor a population of wintering pinnipeds in NYC.

Demography and Viability of Eastern Hellbenders in Western Pennsylvania

Matthew Huang¹, Matthew D Kaunert², Matthew I Palmer¹, Amanda Kissel³, Viorel D Popescu¹

¹Columbia University, New York, NY, USA; ²Lycoming College, Williamsport, PA, USA;

³U.S. Geological Survey, Fort Collins, CO, USA

Abstract:

The Eastern Hellbender salamander (*Cryptobranchus alleganiensis*) plays a critical role in Appalachian systems as an indicator of stream health and water quality. However, land degradation, resource extraction, and infrastructure development have altered hellbender streams and population dynamics, leading to sharp declines over the past three decades. Natural disasters, such as Hurricane Helene in 2024, have further contributed to the demise of seemingly safe populations. As the recovery of hellbender populations across their range remains under question, concerns are mounting about the trends and viability of hellbender populations in western Pennsylvania, the last stronghold for this species in northeastern U.S. This study relies on the largest capture-recapture dataset in the U.S. (2007-2025) to conduct a demographic study across four stream localities in western Pennsylvania with the following objectives: (1) estimate hellbender population size and structure; (2) compare patterns of abundance, survival, and recruitment; and (3) develop population viability models under future environmental change. We use a POPAN model to evaluate apparent survival and abundance through time from 843 hellbender recapture histories. Demographic data from this study and literature will be incorporated into a stage-based population model to evaluate the viability of the western Pennsylvania populations and their resilience to simulated perturbation. This study will provide critical, long-term demographic information to identify high-priority conservation areas as well as guide effective management design aimed at reversing the decline of this iconic amphibian.

Assessing Alaskan Landbird Communities After 21 years in Kenai Fjords National Park

Mack Hughes¹, Sadie Ulman², Ashley Long³ Heather Mathewson¹

¹Tarleton State University, Stephenville, TX, USA; ²Kenai Fjords National Park, National Park Service, Seward, AK, USA; ³Texas A&M University, College Station TX, USA

Abstract:

Bird populations are declining worldwide due to habitat loss, climate change, and other anthropogenic disturbances. In Alaska, warming temperatures and shifts in vegetation communities have transformed the landscape, leading to population declines and altered species distributions. Kenai Fjords National Park, in south-central Alaska, connects two bird conservation regions, the Northern Interior Forest and the Northern Pacific Forest; corridors on either end of the park bypass the Harding Icefield. This connection creates a unique mixture of boreal and temperate rainforest avian species. The Harding Icefield supports numerous glaciers, with many in recession, potentially creating new nesting and foraging areas for landbirds. Climate models project continued shifts in the park's avian communities as environmental changes accelerate, suggesting potential new colonization of species, potential species extirpations, and higher species turnover. A comprehensive inventory of landbird species, including

densities, distributions, and habitat associations, was conducted at the park in June 2005. However, the bird communities have not been reassessed in the 21 years since. After repeating the original inventory sampling protocol in 2026, we provide an assessment of how landbird communities within the park have changed, looking at differences in species presence, distribution, densities, and overall community structure. Assessing change in these landbird communities is important for identifying potential drivers of change, which will be vital for future conservation and management of boreal and temperate bird species in Alaska and elsewhere.

Save the Swamper: Behavioral Differences Between Utila's Two Iguana Species

Alexander W L Jeffords¹, Grace Waldeck¹, Jessica Zhang¹, Matthew Kelly¹, Tom W Brown², Nikita Finger¹, Daisy F Maryon², Kirsten M Bohn¹

¹Johns Hopkins University, Baltimore, MD, USA ²Kanahau Wildlife Conservation, Isla de Utila, Islas de la Bahía, Honduras

Abstract:

Islands are among the most biodiverse regions in the world. They are home to approximately 40% of the world's critically endangered species, with many species found nowhere else. This makes island conservation particularly important for protecting global biodiversity and preventing extinction. Utila Island, one of Honduras' Islas de la Bahía, is home to two native iguana species: *Ctenosaura similis* (the black spiny-tailed iguana or "highlander" iguana), a widespread species found throughout Central America, and *Ctenosaura bakeri* (the Utila spiny-tailed iguana or "swamper" iguana), a critically endangered species native to Utila Island. The endemic swamper faces numerous threats, namely mangrove deforestation, pollution, and illegal poaching, despite federal protection that aims to preserve swamper habitat and prevent their killing by humans. For two weeks in January 2026, we collected video data on Utila Island and compared behavioral patterns between the generalist highlander and the mangrove-specialist swamper. Our research aims to better understand how ecological specialization may shape behaviors by examining activity and behavioral differences between the two species. Improving our understanding of the behavior of *C. bakeri* may also help inform conservation and management strategies for this critically endangered species.

Egyptian Vultures as a Nature-Based Solution for Carcass Disposal in Peri-urban Areas

Sunny Joshi¹, Suneet Naithani¹, Khima Nand Balodi², Himani Singh Khati¹

¹School of Environment and Natural Resources, Doon University, Dehradun; ²Himalayan Institute for Sustainable Environment and Research Society, Dehradun

Abstract:

The rural and peri-urban areas of India have a high number of cattle-rearing practices. Rapid urban expansion has outpaced the development of formal carcass disposal and animal waste management systems, resulting in unmanaged livestock carcasses in peri-urban environments. Such conditions pose risks to the ecosystem, animal health, and public health, aligning closely with One Health concerns. This study assesses the role of the Egyptian Vulture (*Neophron percnopterus*), an Endangered scavenger species, contributing to sanitary ecosystem services in Dehradun, India, where formal carcass management infrastructure is limited. Between 2021 and 2025, systematic monitoring of five unmanaged carcass dumping sites was conducted. Annually, between 8000 and 10000 carcasses of cows, buffaloes, and horses are dumped in these sites. Egyptian Vultures were consistently recorded as primary scavengers of livestock carcasses, reflecting their adaptability, and their closer association with human settlements as compared to other vulture species. At sites with regular vulture activity, carcass persistence times were reduced to 48-72 hours, compared to 7-10 days at sites lacking avian scavengers. Sites with high carcass availability also showed increased presence of feral dogs and other scavengers, indicating elevated risks of zoonotic disease transmission, secondary poisoning, and human–wildlife conflict. Based on observed scavenging rates and biomass consumption, local Egyptian Vulture populations are estimated to remove 75 tonnes of animal biomass annually, representing a cost-effective, nature-based alternative to mechanical carcass disposal.

Late-Season Biodiversity Monitoring Across Urban Gardens in New York City

Zara Kadir, Evelyn M Beaury

New York Botanical Garden, Bronx, NY, USA

Abstract:

Urban green spaces provide critical habitat for biodiversity, but urban landscapes are often understudied relative to other ecosystem types. To better understand the biodiversity supported by green spaces in New York City, in Fall 2025 we compared plant, insect, and bird diversity across three garden types at the New York Botanical Garden (NYBG): a food garden (Edible Academy), a turfgrass lawn (Daffodil Hill), and an ornamental garden (Home Gardening Center). We monitored the diversity and abundance of flowering plants, large insects, small insects, and birds, using online programs such as iNaturalist and BirdNet for automatic species identifications. Over the sampling period, we observed 188 plant species, at least 60 insect species, and 68 different bird species, with unique compositions represented in each garden type. For example, large insect abundance was highest in the ornamental garden, where floral

resources were abundant, but insect diversity was highest in the food garden. The food garden also supported a unique community of birds, with greater similarity between the ornamental garden and turf lawn. The abundance of small flying insects was largest in the lawn with findings up to 317 flies alone, suggesting that even urban gardens with low plant diversity can support high abundance of other taxonomic groups. These findings highlight the influence of site characteristics on urban biodiversity. Even small, urban green spaces can support diverse life, offering opportunities for citizen science and hands-on learning in urban ecology. Overall, we aim to build the data set to examine trends over time.

Forecasting Species Vocal Activity for Strategic Acoustic Recorder Deployment at KSWs

Meet Baani Kaur¹, Yon Tony², Toeu Bann², Khny Sokry², Moeurk Hong³, Roeun Sala³, Hélène Birot^{2,3}, Chhin Sophea⁴, Cain Agger², Dena Jane Clink¹

¹Cornell University, Ithaca, NY, USA; ²Wildlife Conservation Society, Phnom Penh, Cambodia; ³Jahoo, Monduliri Province, Cambodia; ⁴Ministry of Environment, Chamkarmorn, Phnom Penh, Cambodia

Abstract:

Passive acoustic monitoring generates vast audio datasets across Southeast Asia's threatened ecosystems, but practitioners deploying recorders have no empirical basis for predicting when or where target species will be vocally active. At Keo Seima Wildlife Sanctuary (KSWs), Cambodia, this gap translates into inefficient survey effort across the landscape. This project develops and validates a generalizable Machine Learning pipeline that forecasts species' vocal activity from environmental and habitat predictors, enabling recorder deployment to be targeted by expected activity. Pre-verified hornbill and gibbon 2024 detection records from passive acoustic monitors are enriched with satellite derived land cover classifications, GPS clustered locality identifiers, and meteorological variables. Rolling averages of past vocal activity are constructed as seasonality proxies. ML models are then trained on this enriched dataset and validated against held out 2025 detections in a cross year framework. Three hypotheses are being tested: that weather and canopy features predict activity across years, that habitat type moderates environmental dependencies across closed canopy and edge sites, and that locality level rolling averages capture meaningful seasonality patterns. Cross year validation results, evaluated via precision, recall, and identification of high activity periods, will be presented. A validated pipeline would allow monitoring programs under resource constraints to allocate recorder effort by predicted activity, improving detection rates and reducing fieldwork costs across sites managed by the Cornell Lab of Ornithology and Wildlife Conservation Society Cambodia.

Elevational Patterns and Drivers of Longhorn Beetle Diversity in Romania

Yuhyun Kim¹; Bekka Brodie¹; Marian Mirea²

¹Columbia University, New York, NY, USA; ²University of Bucharest, Bucharest, Romania

Abstract:

Environmental gradients shape species distributions by influencing climatic conditions, resource availability, and habitat composition. Saproxylic longhorn beetles (*Coleoptera: Cerambycidae*), closely associated with forest structure and deadwood resources, are sensitive to forest change, yet their diversity in the Romanian Carpathians remains poorly documented. This study examines variation in species richness and community composition along an altitudinal gradient in Vrancea County, Romania. Beetles were sampled using pheromone-baited flight intercept traps (n = 120) distributed across ten sites spanning lowland to montane forests, alongside measurements of habitat attributes relevant to saproxylic communities. Analyses test for a mid-elevational richness peak and evaluate the relative influence of elevation and habitat characteristics on species occupancy. This study provides baseline data on *Cerambycidae* assemblages and identifies environmental drivers of biodiversity, informing conservation planning and forest management in a data-limited region.

Boron Chemistry & Stable Isotope Analysis of Scallops: Data Management/Analytical Tech

Madoka J. Kondo, Alyson Lowell, E. Troy Rasbury, Kathleen M. Wooton, Melissa Passik, Bradley Peterson

Abstract:

Boron chemistry for stable isotope analysis is a specialized method used to examine trace elements in marine organisms. This project involved managing and organizing 300 scallop samples as part of an ongoing collaboration between the Peterson and Rasbury Laboratories. The primary goal was to process and analyze these samples using stable isotope analysis with a mass spectrometer, focusing on boron chemistry. The study involved collecting samples from various sites, where a data chart was created to ensure systematic and accurate sample collection from each location. The samples were then processed using boron chemistry techniques, followed by analysis on a mass spectrometer to determine stable isotope ratios.

Data management was a key aspect of the project, involving meticulous organization and tracking of the samples to maintain consistency and reliability in the analysis. The research team ensured the accuracy of the analysis through careful processing, including the precise handling of equipment and maintenance of laboratory standards.

The results from this work contribute to a deeper understanding of the stable isotope composition of scallops, particularly in relation to the boron isotopic signature. Ultimately, this project aims to create a comprehensive boron isotope map of the Peconic Bay scallops, which will provide valuable insights into the environmental conditions and ecological processes affecting these organisms. The work will also enhance broader knowledge of isotope analysis techniques, offering insights into how trace elements, such as boron, interact with marine organisms.

Herbivory & Fire Influence Nutrient Dynamics in Subtropical Forest-Grassland Mosaics

Amar Kunwar^{1,2}, Uriel Gélín³, Naresh Subedi⁴, Sandeep Regmi^{2,5,6}, Kyle W Tomlinson¹

¹Xishuangbanna Tropical Botanical Garden, Mengla, Yunnan, China; ²University of Chinese Academy of Sciences, Beijing, China; ³Aarhus University, Aarhus, Denmark; ⁴National Trust for Nature Conservation, Lalitpur, Nepal; ⁵Southeast Asia Biodiversity Research Institute, Chinese Academy of Sciences, Mengla, Yunnan, China; ⁶The Himalayan Conservancy, Kirtipur, Kathmandu, Nepal

Abstract:

Disturbance regimes such as herbivory and fire are major drivers of nutrient cycling, vegetation structure, and ecosystem functioning, yet their combined effects remain poorly understood in tropical Asian forest–grassland mosaics. We examined how herbivore use and fire frequency influence soil and plant nutrient dynamics across five vegetation types in Chitwan National Park, Nepal: riverine forest, Shorea forest, tall grassland, short grassland, and grazing lawn. Across 50 plots, we quantified herbivory using mammalian dung counts, estimated fire frequency from MODIS active fire records, and analyzed soil nitrogen, phosphorus, potassium, cation exchange capacity, and plant nitrogen, phosphorus, and potassium. Herbivore use and fire varied strongly among vegetation types. Grazing lawns, short grasslands, and riverine forests showed high herbivore use, whereas tall grasslands had very low dung deposition. Fire frequency was highest in tall grassland and substantial in both forest types, but minimal in short grassland and grazing lawns. Forests generally supported higher soil and plant nutrient concentrations than grasslands. Dung deposition was positively associated with soil nitrogen, potassium, and cation exchange capacity. Fire frequency increased soil phosphorus and cation exchange capacity but reduced plant nitrogen, phosphorus, and potassium. In forests, the interaction between dung deposition and fire reduced soil phosphorus and plant nitrogen and phosphorus in riverine forests but not in Shorea forests. These findings show that herbivory and fire act both additively and interactively to shape nutrient availability in tropical forest–grassland mosaics.

Baby Shark: What an Expanding Nursery Means for White Shark Conservation

Kimberly Lavoie

Atlantic Shark Institute, Westerly, RI, USA

Abstract:

White sharks are charismatic, widespread, super predators of the deep. Despite this, worldwide populations of white sharks declined sharply in the 1900's due to marine mammal declines, targeted hunting, and fisheries related mortality. The Northwest Atlantic subpopulation of white sharks— one of the more well studied populations— has rebounded in numbers. What is more, this region's first nursery area for young of year and neonate white sharks was defined off Long Island in 2018. Recently, two studies by the Atlantic Shark institute assessed the population of white sharks in southern New England through time and found the original nursery area may be larger than previously, due to a recovering population. We illustrate these new ASI studies, and highlight policy, geography, and cultural practices in this region to build understanding of how to protect these baby white sharks everywhere, which are vital to population recovery.

Measuring Forest Biomass, Plant Diversity, and Carbon Across a Landscape Over Time

Amelia Lesniak, Dr. Danijela Puric-Mladenovic, Dr. Sandy Smith

Abstract:

Forests play a critical role in carbon sequestration and ecosystem functioning, yet the relationships among aboveground biomass (AGB), carbon storage, and plant diversity remain complex, particularly across successional stages and over time. This study examines these dynamics within peri-urban forests of the Lake Simcoe watershed in Southern Ontario, Canada, using repeated measurements from permanent forest plots. AGB is quantified using allometric equations derived from field inventory data, allowing for assessment of carbon storage and temporal changes between sampling periods. Plant diversity is evaluated using multiple indices, including taxonomic and functional measures, to investigate its relationship with biomass across forest types and successional stages. Statistical analyses, including ANOVA, regression, and mixed-effects models, are used to identify patterns and test relationships. Additionally, the study aims to develop an integrated biomass–diversity index to better characterize forest condition. By combining high-resolution field data with repeatable methods, this research provides insight into forest carbon dynamics and biodiversity interactions, supporting improved forest management and conservation strategies in rapidly changing peri-urban landscapes.

Behind the "Optimization": Drivers of Protected Area Downsizing in China

Miranda Jieli Li^{1,3}, Siyu Qin², Rachel Golden-Kroner³

¹University of British Columbia, Vancouver, British Columbia, Canada; ²The Nature Conservancy, Arlington, VA, USA; ³World Wildlife Fund, Washington, DC, USA

Abstract:

China is currently in a period of rapid protected area (PA) reform, creating a new national parks system and consolidating existing PA categories and governance. Yet the reform has also included significant boundary redraws and PA downgrading, downsizing, and degazettement (PADDD), which has implications for China's spatial targets like 30x30, as well as local lives and livelihoods. In October 2024, as part of its broader reform, China released nationwide proposed boundary adjustments, impacting 9,247 PAs and more than 3% of its total land area. While framed as an "integration and optimization," the reform also resulted in 140,000 km² of land downsized from existing PAs. Initial analyses show significant variation in area removed and proximate causes by province and type of PA. We further ask: are provincial-level socioeconomic indicators correlated with the magnitude and cause of PA downsizing? We aggregate area removed and proximate causes (e.g., agriculture, forestry, mining) to the provincial level and estimate linear regression models against GDP per capita, urbanization rate, and population density. This analysis provides a first step toward identifying political-economic risk factors for PADDD and understanding the broader drivers of China's most systemic PA boundary reform to date.

Systematics of a Novel Species of Nudibranch from Western Australia

Zellie B Lipman^{1,2}, Jessica A Goodheart¹, Jack Bateman²

¹American Museum of Natural History, New York, NY, USA; ²Bowdoin College, Brunswick, ME, USA

Abstract:

Marine invertebrate biodiversity remains under-characterized, and faces unique challenges in the Indo-Pacific region, where species richness is high and taxonomic resolution is limited. Nudibranchs are a type of sea slug known for their charismatic coloration and unique chemical defense mechanisms. They can be especially prone to cryptic diversity, which complicates efforts to delimit species boundaries. Here, I investigated the systematics of a putative new species of nudibranch collected from Western Australia using an integrative approach that combines morphology and multi-locus phylogenetics. Morphological comparisons reveal consistent differences in coloration and cerata relative to the described species. Inferred maximum-likelihood phylogenetic trees, genetic distances, and haplotype network analyses were created using sequence data from mitochondrial (COI, 16S) and nuclear (H3) markers. Across

all analyses, the focal specimens form a well-supported clade within the genus *Abronica*, remaining distinct from all four described species. The genetic divergence between the novel lineage and its closest relatives is higher than the intraspecific variation observed elsewhere in the genus, and the haplotype network shows clear separation from other sampled taxa. Altogether, these results support the recognition of a previously undescribed species in the *Abronica* genus. More broadly, this study highlights hidden diversity in Indo-Pacific nudibranchs, and underscores the importance of an integrative taxonomic approach to resolve species boundaries in marine invertebrates.

Monitoring the Endangered Florida Bonneted Bat Using Passive Acoustics

Sofia Lopez Farina¹, Amir A Khoddamzadeh¹, Clinton Jenkins¹, Frank Ridgley²

¹Florida International University, Miami, FL, USA; ²Zoo Miami, Miami, FL, USA

Abstract:

The Florida bonneted bat (*Eumops floridanus*) is one of the rarest, most endangered mammals in the U.S., its conservation has become increasingly urgent as rapid urbanization and habitat loss continue to reduce suitable roosting and foraging habitats. Bats act as natural pest controllers that reduce crop damage and insect-borne diseases, strengthening the U.S. agricultural industry by saving up to \$53 billion annually through pest control alone (USDA and USGS). In the Redlands area, conserving *E. floridanus* benefits both biodiversity and farming communities, due to its high agricultural significance. To further support the Florida Redlands' ecological conservation efforts, this study utilizes passive acoustic monitoring to characterize the bat activity across three locations inhabiting a variety of microenvironments. Acoustic recorders were strategically deployed near water systems, elevated areas, crop fields, and human structures to evaluate spatial patterns of activity, while environmental variables including temperature, wind, precipitation, and lunar illumination were recorded to assess how abiotic factors influence the bat's nocturnal behavior. All detections were archived through the North American Bat Monitoring Program (NABat) to support long-term accessibility to conservation planning. By the return of the wet season (August), this research is expected to see a range of 400-700 total *E. floridanus* calls (~1.3% of total detections), establishing a quantitative insight into *E. floridanus* presence and temporal niche partitioning in the Redlands, providing critical information to guide habitat management, land-use decisions, and future conservation strategies.

Plant Growth Interactions Among Native and Exotic Species in a Secondary Forest

Yaire Marte Hernández, Diego Torres Rodriguez, Denny S Fernández del Viso

University of Puerto Rico – Humacao Campus, Humacao, Puerto Rico, USA

Abstract:

Evaluating interspecific competition between *Guarea guidonia*, a native species of Puerto Rican forests, and exotic species *Ardisia elliptica* and *Spathodea campanulata* is essential for identifying patterns of ecological succession. This study seeks to determine what occurs when *A. elliptica* and *S. campanulata* coexist with *G. guidonia* and how this interaction affects their relative growth in a secondary forest. Treatments consisting of 12 pairs of saplings (< 0.5 m tall) for each combination were established: GA (*A. elliptica* and *G. guidonia*), GS (*S. campanulata* and *G. guidonia*), AA (*A. elliptica* - *A. elliptica*), GG (*G. guidonia* - *G. guidonia*), and SS (*S. campanulata* - *S. campanulata*). For all pairs, two growth measurements were made, spaced two months apart, recording height, number of simple leaves, and, where applicable, compound leaves and leaflets. Canopy cover was also measured in each case. Preliminary results indicate that *G. guidonia* showed greater growth when paired with conspecifics compared to the other two species. *A. elliptica*, on the other hand, grew 10.65% and showed no effects on its growth due to differences in canopy cover. In contrast, *G. guidonia* grew 8.24% and responded negatively to increased cover, suggesting that *A. elliptica* may be more successful than *G. guidonia* in a closed understory.

Improving Access to Conservation Resources Through "Small" LLMs

Eliane Martel¹, Zachary Lau², Jahra Chaudhury²

¹Hunter College High School, New York, NY, USA; ²Manhattan Center for Science and Mathematics, New York, NY, USA

Abstract:

This project aims to address the lack of accessibility in conservation materials available to the public through NCEP by creating a Large Language Model that helps educators and students quickly navigate and understand the collection's resources. This topic is important because good conservation work largely depends on informed decision-making, yet materials, especially those of high quality and backed by AMNH, are often hard to access, or even worse, hard to read and decipher. We used Python to build and test LLM-powered tools capable of summarizing, searching, and extracting key insights and ideas from the NCEP modules. By improving access to these modules, we hope to help broaden participation in conservation education and, more generally, support a global effort in conservation.

Natural vs. Artificial Wave Creation Phenomena: Their Influence on Shoreline Erosion

Cecilia Mbonu, Hebah El Sharkawi, Surid Sopnil

Abstract:

This project focuses on the frequency and intensity of waves and their potential impact on shoreline erosion. Observing different wave forming factors, such as high natural fetch (the distance wind travels over an open body of water) and boat wakes, can show how both natural and artificial waves differ in their impact on shoreline erosion in Jamaica Bay, Queens.

Uncovering the Impact of Defaunation on Amazonian Herpetofauna

Owen McCool¹, Jacob Vogin¹, Juan Pablo Castro Arevalo², Therese Lamperty^{1,3}

¹University of Florida, Gainesville, FL, USA; ²Universidad San Francisco de Quito, Quito, Ecuador; ³National Science Foundation, Alexandria, VA, USA

Abstract:

Defaunation, often characterized by localized declines of large-bodied mammals, is becoming increasingly widespread across the tropics due to unsustainable hunting. Defaunation can restructure faunal communities by releasing small mammals (e.g., rodents) from competition and predation, increasing their abundances. Because small mammals are key prey for many snake species, these shifts in the prey base may extend to higher trophic levels via bottom-up effects. However, the effects of defaunation on snakes remain largely unexplored. To address this, we used a combination of standardized visual encounter surveys, opportunistic sampling, and third-party observations at two comparable field sites in the Ecuadorian Amazon: one defaunated and one faunally-intact. Small mammal detections were ~3.5x higher in the defaunated site. While total snake density and diversity estimates were similar between sites, mammal-eating snakes had marginally higher densities in the defaunated site, potentially suggesting prey-driven shifts in snake community structure. These results provide insight into how a widespread phenomenon affects an important and understudied group of animals. Snakes serve vital ecological roles, and understanding the indirect effects of defaunation on this taxon can provide insight into future conservation efforts.

Honey Bee Pollen-Foraging Phenology Based on Plant-Bloom Timing in an Urban Habitat

Isabelle N McMenimon^{1,2}, Cole F P Moran-Bariso^{1,2}, David C Gilley¹

¹William Paterson University of New Jersey, Wayne, NJ, USA; ²Pennsylvania State University, Hershey, PA, USA;

Abstract:

To successfully provision the colony with protein and other essential nutrients, honey bee colonies track ephemeral floral food sources and make adaptive group decisions about which pollen species to reject, which to collect, and in what quantities. This project investigates honey bee colony pollen foraging preferences and how they change over time in an urbanized environment. To determine honey bee colony pollen foraging preferences over a 5-month active season, 24-hour pollen samples from two freely-foraging honey bee colonies were analyzed once per week, while we simultaneously monitored the field to determine the plant-bloom timeframes of 41 taxonomically unique pollen-source plants within the colonies' foraging range. Our results reveal dynamic foraging patterns including the richness & diversity of a colony's weekly pollen harvest, distinctions in foraging preferences between introduced and native sources, along with a phenological calendar highlighting the mutualism between honey bees and their pollen-food source plants. Honey bees collected at least 33 plant species in detectable amounts, with an average of 6 species in any single 24-hour colony harvest. Foragers collected an average of 2.3 new pollen sources per week, suggesting effective tracking of ephemeral floral sources throughout the season. An average of 13.7 known pollen sources were in bloom per week, with foragers utilizing 5.6 sources on average, showing that rejection of food sources is a major element of pollen-diet choice. The phenological calendar generated by this study reveals a set of key pollen sources that may serve as benchmarks to assess future phenological mismatch driven by climate change.

Linking Moss Canopy Architecture to Green Infrastructure Ecosystem Services

Taylor McNamee¹, Aleca Borsuk^{1,2}

¹Columbia University, New York, NY, USA; ²New York Botanical Garden, Bronx, NY, USA

Abstract:

Though small in stature, mosses are emerging as an important tool in urban conservation ecology. To understand the ecosystem services provided by several moss species in New York City (NYC), We are (1) modeling the 3D structure of various moss species of different growth types, (2) determining the strength of ecosystem functional traits of a subset of urban mosses, and (3) identifying the intersection of these structural and functional traits, including water retention, carbon sequestration, and heat mitigation, to inform their use in urban green infrastructure. To accomplish these goals, moss canopy architecture will be quantified via 3D microcomputed tomography (microCT) imaging and linked to functional traits such as carbon assimilation, water retention, and thermal buffering of concrete substrates. We will study various species of acrocarpous mosses, characterized by upright growth, and pleurocarpous mosses, characterized by prostrate growth, found in New York. The applications of this research

include increasing the presence of green spaces in NYC and reducing the immediate, local effects of climate change. An outreach project is proposed to increase awareness of the benefits of moss within an ecosystem and to facilitate the widespread use of moss green walls.

Environmental History of *Anguilla rostrata* (American Eel)

Matthew Acevedo^{1,2}, Adam Jadhav², Priyanka Mohan^{2,3}, Kurt Sarpong^{2,4}

¹Harlem Village Academy, New York, NY, USA; ²American Museum of Natural History, New York, NY, USA; ³Macaulay Honors College, New York, NY, USA; ⁴City College of New York, New York, NY, USA

Abstract:

Anguilla rostrata, also known as American eels, are long, snake-like fish found in streams, rivers, lakes, and ponds along the East Coast. This research focuses on finding the origins of the social stigma surrounding the consumption of the eel through anthropological research, with the hopes of bringing awareness to the past and present cultural importance of the currently endangered species. Our findings show that eels were present and significant to Pilgrim and Native American society, even serving as sustenance for the first European settlers in their first, notoriously harsh, months in America. From that point on, there exists an undeniable connection between prominent cultures in America and a culinary reliance on the eel. Today, the social stigma toward the consumption of eel is widespread across the country, and the goal of this research is to create a timeline of the significance of the eel and pinpoint when in time it became negligible to American cuisine. The timeline is formed from a discourse analysis of the term “eel” within The New York Times archival database, which spans from 1851 to the present day.

Linking Forest Structure to Avian Occurrence After a Hurricane in Puerto Rico

Stephen Mooney, María Uriarte, Marcia Macedo, Viorel Popescu

Columbia University, New York, NY, USA

Abstract:

Tropical forests support exceptional biodiversity structured by steep vertical gradients in canopy height, foliage layering, and understory density. Disturbances, such as hurricanes, simplify this structure, reducing vertical niche availability and disproportionately impacting specialist bird species that rely on specific forest strata. As climate change increases hurricane frequency and intensity, understanding how structural changes in forests shape avian communities is critical for assessing tropical forest resilience. To evaluate this, we integrated LiDAR data collected before and after

Hurricane Maria (2017) with passive acoustic monitoring within the Luquillo Experimental Forest in Puerto Rico. We derived metrics of canopy height, vertical complexity, gap structure, and canopy openness, and linked these to species occupancy and community composition using automated acoustic detections. Our study showed that hurricane-driven canopy simplification reduced avian niche diversity and was associated with declines in specialist species, while generalists increased in relative activity across sites and habitats. These results demonstrate that vertical forest structure is a strong predictor of tropical avian composition and identify structural thresholds associated with community responses to hurricane disturbance. Our work provides a scalable framework for linking remote sensing and bioacoustics and offers insight for post-hurricane conservation in Puerto Rico and other disturbance-prone tropical forests.

Honey Bee Colony Pollen-Foraging Preferences & Plant-Bloom Timing in Northeastern U.S.

Cole F P Moran-Bariso^{1,2}, Isabelle N McMenimon^{1,2}, David C Gilley¹

¹William Paterson University of New Jersey, Wayne, NJ, USA; ²Pennsylvania State University, Hershey, PA, USA

Abstract:

Environmental stressors such as phenological mismatch between flowering plants and insect pollinators driven by climate change are leading to pollinator decline. This project investigates honey bee colony pollen foraging preferences and how they change over time in an urbanized northeastern environment. To successfully provision the colony with nutrients, honey bees track ephemeral floral food sources and make adaptive group decisions about which pollen species to reject, which to collect, and in what quantities. Over a 5-month foraging period, 24-hour pollen samples from two freely-foraging honey bee colonies were analyzed once per week, while we simultaneously monitored the field to determine the plant-bloom timeframes of 41 taxonomically unique pollen-source plants within the colonies foraging range. Honey bees collected pollen from at least 33 plant species in detectable amounts, with an average of 6 species in any single 24-hour colony harvest. Foragers collected an average of 2.3 new pollen sources per week, suggesting effective tracking of ephemeral floral sources throughout the season. An average of 13.7 known food sources were in bloom per week, with foragers utilizing 5.6 sources on average, showing rejection of food sources is a major element of pollen-diet choice. These data provide a detailed benchmark for pollinator-plant phenology, while highlighting the ongoing mutualism between plants and insect pollinators. Pollinator decline and honey bee diet-choice dynamics are increasingly important to understand as they not only drive angiosperm reproduction in

both natural and agricultural ecosystems but also are expected to be impacted strongly by climate change.

Push, Not Pull: Mormon Cricket Sensory Worlds and Directions for Research

Li Murphy¹, Sercan Sayin^{2,3}, Pavan Kaushik^{2,3}, Vishwanath Varma^{2,3}, Iain D Couzin^{2,3}, Gregory A Sword⁴

¹Yale University, New Haven, CT, USA; ²Max Planck Institute of Animal Behavior, Konstanz, Germany; ³University of Konstanz, Konstanz, Germany; ⁴Texas A&M University, College Station, TX, USA

Abstract:

In outbreak years, millions of Mormon crickets (*Anabrus simplex*) march unpredictably across the western US, forcing land stewards to manage roadway hazards, crop damage, and public "ick"—often with pesticides as the only tool at hand. Developing non-chemical deterrents requires probing the individual cricket's Umwelt: what it senses, and how those cues drive the marching that alarms (and sometimes harms) people. The cannibalistic, protein- and salt-limited "forced march" is well established (Simpson et al. 2006): crickets move partly to escape conspecifics closing from behind and pursue those ahead. What remains unknown is which sensory cues mediate this, and whether the dynamics differ from the neighbor-bearing, consensus framework recently shown in desert locust collective movement (Sayin et al. 2025). To address this, we combined UAV tracking of band structure and velocity fields, sub-gram insect-mounted wireless microcameras (<0.8 g) capturing insect-perspective video with onboard IMU, and a portable field virtual-reality (VR) system. Using VR, we manipulated the visual swarm cues available to individuals while measuring turning and acceleration against the relative bearing of approaching conspecifics. Early results reveal a "push" asymmetry: crickets move forward when a virtual swarm approaches from behind, rather than being "pulled" by attraction to those ahead—consistent with cannibalism-driven marching and distinct from the pull-based locust system. These findings contribute to collective-motion theory and may inform the design of non-chemical deterrents.

The Mobile Living Lab: Putting Today's Technology in the Hands of Today's Farmers

Riley Kovalcik, Bethany Lopez, Ethan Poon, Fallon Regan, Malina Wong, Esther Chikuse, Charles Carpenter III, MeiLi Haan, Manreet Bhullar, Matthew Murray, Alex C Moore

Abstract:

Large scale agriculture is integral to the health of modern society, but is being left behind in the face of today's rapid technological growth. To address this gap, this

project aimed to leverage technological advances to support modern farmers in their everyday work. The project team designed and constructed a “Mobile Living Lab” trailer to conduct on-farm research, deliver training on food safety and postharvest quality interventions, and demonstrate user-friendly applications at fresh produce farms. This trailer, retrofitted with equipment and technology related to water treatment, sanitation, and postharvest quality, allows farmers to assess crop quality on-site and collect data relevant to ensuring the continued health and success of their farms. Following the construction of a pilot stage of the trailer, the project team conducted demonstrations of the Mobile Living Lab to local farmers, created a user manual guide to share with potential future users, and made recommendations for scaling up this type of technology. Through the Mobile Living Lab, technological innovations are being put directly into the hands of farmers to bring large scale agriculture into the new age.

Lemurs Through Two Lenses: Participatory and Ecological Insights in Madagascar

Rhea Noronha, Travis Steffens, Karine Gagné

University of Guelph, Guelph, ON, Canada

Abstract:

The proposed research, situated within environmental anthropology and grounded in political ecology and ethnoprimateology, explores how knowledge from forest-dwelling communities can complement scientific camera-trap data to deepen understanding of lemur ecology and human–lemur interactions at Ambanjabe field site in Ankarafantsika National Park. Local residents draw on lived experience and cultural practice to interpret species behavior, habitat use, and landscape relationships, while conservationists use camera traps to document ecological patterns, particularly of cryptic and nocturnal species. These approaches are often applied independently, limiting holistic insight. Fieldwork will take place from May to August 2026. In the first month, meetings with local authorities and community members will introduce the project and camera traps, incorporate a participatory photovoice approach, and collaboratively determine camera placement based on local knowledge, cultural beliefs, and scientific guidelines. In the second month, semi-structured interviews informed by ethnoprimateological frameworks will explore participants’ experiences with lemurs and forest landscapes. Concurrently, infrared camera traps will record lemur occurrence and behavior. In the final phase, photo elicitation sessions will present footage and photographs for collective interpretation and discussion of conservation strategies. By integrating participatory interpretation with ecological monitoring, this project advances methodological innovation through the use of camera traps in photovoice, centers Malagasy perspectives, and offers a collaborative model for culturally informed conservation planning.

Physiological Responses to Heat Stress in *Anthopleura elegantissima*

Garrett Ordonez, Daniel Olivares, Carly Kenkel

University of Southern California, Los Angeles, CA, USA

Abstract:

Understanding how marine organisms respond to increasing thermal stress in response to climate change requires a linkage between physiological and symbiotic variation. The intertidal sea anemone *Anthopleura elegantissima* offers a powerful model system (phylum and class as corals), considering how it occupies this stressful environment as well as how it exists in both symbiotic and aposymbiotic states.

This study investigates how intertidal origin (high vs. low) and symbiotic conditions shape baseline physiological responses that may influence thermal tolerance.

Individuals collected from distinct intertidal zones are maintained under controlled laboratory conditions, where I quantify color score using standardized photos and assess symbiotic state through chlorophyll concentration. In parallel, aposymbiotic individuals are experimentally generated through light and salinity manipulation to establish a controlled comparison between symbiotic states.

This baseline dataset establishes the physiological and symbiotic relationship necessary to test how these factors mediate responses to future heat-stress treatments.

By building an experimental framework that integrates ecological origin with symbiotic flexibility, this work provides a foundation for understanding how cnidarian systems may respond to warming oceans. These findings will inform ongoing experiments examining molecular and physiological responses to heat stress, with broader implications for predicting resilience in symbiotic marine organisms.

Beyond Canopy Closure: Portfolio-Based Forest Resilience Assessment

Doreen Owusu¹, Mark Ashton¹, Simon Queensborough¹, Valerie Fummey Nassah²

¹Yale University, New Haven, CT, USA; ²Forestry Commission, Accra, Ghana

Abstract:

Nearly all restoration interventions ultimately aim to guide degraded forests towards old-growth conditions. However, the rapid expansion of plantation-based restoration across Africa raises a critical question: are these interventions fostering diverse, resilient forest systems, or producing simplified, homogeneous stands that may be vulnerable to future disturbances? This concern highlights the need to move beyond short-term metrics and instead evaluate restoration as a portfolio of ecological strategies balancing risk, species composition, functional traits, and structural

complexity across environmental gradients. Understanding whether current approaches enhance or constrain long-term resilience is essential for designing restoration systems that can withstand climatic and ecological uncertainty. This project addresses a key gap by examining how environmental factors such as moisture and topography interact with restoration strategies like assisted natural regeneration (ANR) and plantations to influence long-term recovery. Focusing on the Sui River Forest Reserve in the Western North of Ghana – recognized as a Key Biodiversity Area and an Alliance for Zero Extinction site, serving as the last known habitat for the critically endangered giant squeaker frog (*Arthroleptis krokosua*). It also supports western chimpanzees, threatened bird species, and endangered timber species such as *Tieghemella heckelii*. The study compares restoration sites to reference forests to assess whether they are converging toward natural conditions. Ultimately, it aims to identify which restoration strategies most effectively promote biodiversity, structural complexity, and resilient forests.

Ecogeographic Diversity and Potential Adaptation in Lima Bean (*Phaseolus lunatus*)

Aura Patiño-García, María Isabel Chacón-Sánchez

Universidad Nacional de Colombia, Bogotá, Colombia

Abstract:

Climate change is reducing precipitation while increasing temperature and evapotranspiration across many regions worldwide, intensifying water limitation. Although Lima bean (*Phaseolus lunatus* L.) occurs in dry environments and exhibits a broad environmental range, it remains unclear how environmental variation structures its diversity and how these patterns can inform conservation strategies under climate change. We characterize the ecogeographic diversity of wild and cultivated Lima bean accessions across its distribution and examine their patterns along multiple environmental gradients, including those related to water availability, as an approach to infer potential adaptive processes. We integrate georeferenced passport data from germplasm collections with climatic, edaphic, and geophysical variables. Environmental variation is summarized using principal component analysis (PCA), and ecogeographic groups are delineated using unsupervised clustering methods, representing contrasting environments occupied by the species. This approach allows the identification of gradients associated with the distribution of diversity and the evaluation of whether these patterns are consistent with adaptive processes, providing indirect evidence based on environment–distribution associations. The expected results will inform conservation and use strategies for *Phaseolus lunatus*, including the identification of germplasm with potential under water stress and supporting the prioritization of conservation actions under climate change.

Exploring the Landscape Use of African Grey Parrots Through AI-Powered Bioacoustics

Sophia Pasold, Bobbi Estabrook, Daniela Hedwig
Cornell University, Ithaca, NY, USA

Abstract:

Once an abundant species of equatorial Africa, the African grey parrot (*Psittacus erithacus*) is now classified as endangered, having faced drastic declines due to habitat loss and trapping for the international pet trade. Monitoring efforts remain insufficient, and our understanding of the species' ecology and behavior is limited. Passive acoustic monitoring (PAM) offers a cost-effective way to investigate population trends, activity patterns, and the behavior of acoustically conspicuous species at an unprecedented spatiotemporal scale. In this study, we 1) evaluated and improved the performance of a machine-learning model (BirdNET) to detect parrot vocalizations in sound recordings derived from a 1250 sq km acoustic monitoring grid in Nouabalé-Ndoki National Park and adjacent logging concessions in the north of the Republic of the Congo. 2) We used the extracted parrot vocalizations to investigate spatiotemporal patterns in the landscape use of grey parrots in this study area. We hypothesized that their landscape use will be non-random, with their vocal activity highly correlated with environmental conditions. We used occupancy models and a model selection approach to investigate the occurrence of parrot vocal activity in relation to various environmental covariates, including habitat type, land use status, season, canopy height, and proximity to water bodies and forest clearings. Consistent with our hypothesis, grey parrot landscape use was non-random and affected by environmental conditions. By exploring the spatiotemporal patterns of the grey parrot, this study enhances our understanding of this species and its conservation needs.

What is Killing Nepal's Rhinos? Trends and Drivers of Mortality

Abhinaya Pathak, Shermin de Silva
University of California San Diego, La Jolla, CA, USA

Abstract:

Reducing wildlife poaching is often treated as the primary measure of conservation success, yet risks persist after poaching declines. Using 26 years (1998-2023) of verified mortality records for Greater One-Horned Rhino in Chitwan National Park, Nepal, we analyzed long-term shifts in causes and spatial patterns of death. Poaching declined sharply after 2007, but annual mortality now approaches 5% of the population and is dominated by non-poaching causes, including fighting, disease, predation, and

accidents. Mortality hotspots cluster near floodplains and wetlands, indicating a density and habitat-mediated regime that demands management beyond anti-poaching alone.

Mapping Illicit Pangolin Trade Routes Between India and Myanmar

Trishanti Paul

Langland Conservation, Dorset, United Kingdom

Abstract:

Pangolins are currently the most trafficked mammals globally, with the illegal wildlife trade (IWT) posing an existential threat to their populations. A critical gap in conservation efforts is the lack of detailed spatial data regarding the specific corridors used by trafficking networks across international borders. This study focuses on mapping the illicit trade routes for pangolins originating in India and moving towards Myanmar and beyond.

Using a combination of open-source intelligence (OSINT) trawls and Geographic Information Systems (GIS), this research identifies key trade hubs and generates assessed routes based on historical seizure data and transport infrastructure analysis. A significant portion of the analysis focuses on the trans-border corridor from Mizoram, India, specifically mapping the transition points from Zokhawthar into Myanmar's trade hubs.

The results provide a granular view of the logistics behind the trade, moving beyond general trade flow to specific, assessed transit corridors. For NGOs and enforcement agencies, this spatial intelligence is vital for prioritising monitoring efforts and implementing targeted interventions in border regions. This research underscores the necessity of utilising GIS-based threat mapping to disrupt the supply chains of the world's most trafficked species.

The Foraging Habits of Common Terns, Least Terns & Black Skimmers in RBESNA

James Jr Pechera, Semiyah Walter, Adesola Ogunsola

Abstract:

This project's purpose was to observe and record the foraging dynamics of terns and skimmers that nest in the RBESNA so as to better understand the fish populations and habitats these birds depend on during their breeding season.

Gut Check: Using Dietary and eDNA Analysis to Inform Fish Conservation in the Bronx

Eden Pichardo¹, Everett Gamache², Laura Furtado³, Dean Bobo³, Ryan Thoni³, Adam Jadhav³, Ana Porzecanski³, Suzanne Macey³

¹Spelman College, Atlanta, GA, USA; ²SUNY College of Environmental Science and Forestry, Syracuse, NY, USA; ³American Museum of Natural History, New York, NY, USA
Abstract:

The Bronx River has undergone a centuries-long history of exploitation and pollution that has changed the conditions of the only freshwater river in NYC, but groups like the Bronx River Alliance and NYC Parks work to monitor and improve the river for both nearby residents and the animals that live there. To better inform species recovery efforts, we collected and extracted DNA from the gut contents of two introduced species: the common carp (*Cyprinus carpio*) and the largemouth bass (*Micropterus salmoides*). We also examined water eDNA samples from the same location as the fish collection, at the top of the 182nd Street dam. All DNA samples underwent initial metabarcoding attempts that were followed by Sanger sequencing using genus and species-specific primers to target two prey species of conservation interest, respectively: the alewife (*Alosa pseudoharengus*) and American eel (*Anguilla rostrata*). Through analysis of Sanger sequence data, we found no traces of American eel DNA within the gut samples of the 10 carp collected, but eel DNA was found within the stomach contents of 3 of the 4 of the largemouth bass collected and 4 out of 30 water samples. The primer used for alewife was not appropriate for this sequencing method. While metabarcoding results are forthcoming and will contribute to a broader understanding of the diet of these introduced species and the communities of the river, Sanger sequencing can be a lower-cost alternative to monitor species of concern and their potential predators. This information provides a foundation for information pertinent to conservation decisions made by NYC Parks and the Bronx River Alliance regarding introduced species.

Flooding From the Bay: The Effects of Sea Level Rise

Djibril Pilgrim, Miki Ortiz, Aminata Dieng

Abstract:

Climate change driven sea level rise has worsened flooding in the rockaways, especially in areas closer to Jamaica Bay. These floods have been destroying properties as well as negatively impacting the environment. The Garden By The Bay—a local community garden in Rockaway— has been largely impacted by the floods from Jamaica Bay high tides. We studied the areas in The Garden By The Bay in which flooding has been the most prevalent, and assessed how those specific areas are affected by the floods.

Does Native Plant Diversity Protect Against Invasive Species?

Urmi Poddar, Rafael D'Andrea
Stony Brook University, Stony Brook, NY, USA
Abstract:

Given the well-known negative impacts of invasive species on biodiversity, it is important to understand the processes that drive invasibility. One key hypothesis on invasibility, known as the diversity-invasibility hypothesis, states that more diverse and species-rich communities should be less vulnerable to invasion, due to biotic resistance from native species. While this hypothesis has long been debated, recent large-scale studies found negative associations between native and introduced species diversity, which was interpreted as support for this hypothesis. However, such negative associations can also arise due to the negative impacts of introduced species on native diversity. Here we attempt to disentangle these two processes (biotic resistance vs introduced species impacts) by using long-term vegetation composition data from National Ecological Observatory Network (NEON), a network of ecological monitoring sites across the US. We use time-series data to assess the relationship between introduced plant richness in a given year and native plant richness in previous years (biotic resistance), and vice-versa (introduced species impacts). This work is still ongoing, but preliminary results indicate that introduced plants have a significantly negative effect on future native plant diversity, while native diversity has no effect on future exotic diversity. This suggests that the previously-reported negative associations between native and introduced diversity are largely driven by the impacts of introduced species, rather than by biotic resistance from the native community. Thus, increasing native diversity may not be a reliable method of preventing invasions.

Carbon and Water Responses to ENSO: Insights From an Experimentally Burned Forest

Nathalia Potter^{1,2}, Paulo Brando¹

¹Yale University, New Haven, CT, USA; ²Columbia University, New York, NY, USA

Abstract:

Fire disturbance fundamentally restructures ecosystem carbon and water cycling, yet the interplay between post-fire recovery and large-scale climate variability remains poorly understood. We examined a decade (2014–2024) of eddy covariance measurements from an experimentally burned plot in southeastern Amazonia to characterize long-term trends in net ecosystem exchange (NEE), evapotranspiration (ET), gross primary production (GPP), and ecosystem respiration (Reco), and to quantify the modulating effects of El Niño–Southern Oscillation (ENSO). Using generalized additive models applied to daily flux data, we found significant nonlinear long-term trends in all four fluxes and strong seasonal cycles driven primarily by radiation, air

temperature, and vapour pressure deficit. La Niña conditions sustained the highest flux amplitudes, with significantly elevated ET, GPP, and Reco and the strongest seasonal cycles. El Niño reduced mean flux levels and preserved seasonal dynamics in Reco and NEE, while Neutral years suppressed GPP and Reco seasonality. NEE showed no significant mean response to ENSO phase, suggesting that concurrent reductions in productivity and respiration maintain a stable carbon balance across ENSO states. VPD exerted consistent negative controls on GPP and ET, consistent with stomatal limitation under drought stress. These findings highlight the dominant role of La Niña-driven wet conditions in sustaining carbon and water flux amplitudes in a post-fire Amazonian forest, and underscore the sensitivity of ecosystem recovery to interannual climate variability.

Impacts of Coastal Development on Biocultural Diversity in Costa Rica

Zakary Purcell, Christian J Rivera

University of Massachusetts Boston, Boston, MA, US

Abstract:

Tropical coastal systems are facing increasing pressures from rising development and the challenge of balancing economic growth with impacts on biodiversity and local communities. Costa Rica's rapidly changing coasts are longstanding sites for conservation biology research and offer an opportunity for novel insights on the impacts of development on coastal biocultural diversity. We use a mixed-methods approach and apply an integrative urban biocultural diversity framework to assess how local perceptions of development impacts compare to measurements of biodiversity and biocultural diversity across a development gradient (four urban settlements along Costa Rica's Pacific coast). We use qualitative methods including oral history interviews and participant observation to document lived biocultural diversity. Quantitative methods include ecological surveys and spatially explicit surveys of biophysical expressions of biocultural diversity and development indicators. We then propose a fine-scale and spatially explicit index of urban biocultural diversity and relate development indicators to species richness and biocultural diversity across sites. Our results will shed light on overlooked impacts of development on coastal communities towards centering local-level realities, perspectives, and needs into current discourses of conservation and development in Costa Rica.

Seasonal Adaptation in Ranging Behavior of *Propithecus diadema* in Tsinjoarivo

Niony Mamy Koloina Rakotoarivelo¹, Chloé Gherardi², Sarah Rajaonarivelo¹, Bruno Ramarosata³, Jean Luc Fanomezantsoa Raharison³, Abigail Ross^{4,5}, Jean Freddy Ranaivoarisoa¹, Lala Harivelo Ravaomanarivo¹, Mitchell Irwin²

¹University of Antananarivo, Antananarivo, Madagascar; ²Northern Illinois University, DeKalb, IL, USA; ³NGO SADABE, Antananarivo, Madagascar; ⁴The Dr. Abigail Ross Foundation for Applied Conservation (TDARFAC), Chicago, IL, USA; ⁵University of Florida, Gainesville, FL, USA

Abstract:

Madagascar's forests are threatened by human activities, reshaping distribution of resources that lemurs depend on. Understanding how lemurs adjust their movement in home range and daily path length to seasonal resource variation is essential to interpreting behavioral ecology and informing conservation strategies. *Propithecus diadema*, critically endangered lemur endemic to Madagascar, has been the focus of behavioral and ecological research in Tsinjoarivo since 2002. Previous studies have documented female dominance, diet and fission-fusion dynamics. Seasonal variation in daily path length remains insufficiently explored. This study investigates seasonal patterns of daily travel distance in *P. diadema* within Tsinjoarivo Protected Area to identify ecological drivers of movement and home range use. We assess differences in daily path length between dry season (July-September) and wet season (February-April) and evaluate influence of food availability on ranging behavior. Data were collected from two groups in continuous forest and three groups in fragmented forest. Instantaneous focal sampling was used alongside continuous data collection on feeding and social behavior. Botanical plots and phenological surveys were used to quantify temporal variation in food resources. We expect daily path length and home range use to vary significantly between seasons, with increased movement during periods of fruit abundance. By integrating behavioral and ecological data, this study provides new insights into movement ecology of sifakas and clarifies how environmental variability shapes lemur behavior and inform habitat restoration and corridor design in Madagascar's threatened forests.

Linking Community Governance and Mapping for Resilient Protected Areas in Madagascar

Seheno Ramanantsoa

University of Mahajanga, Mahajanga, Madagascar

Abstract:

Madagascar's protected areas must balance biodiversity conservation with local livelihoods under increasing climate and land-use pressures. The country hosts approximately 151 protected areas covering nearly 8 million hectares, surrounded by 1,531 community-based natural resource management transfers forming critical "green belts". Yet conservation effectiveness is often assessed only within protected area

boundaries, overlooking the governance and spatial dynamics of these surrounding socio-ecological production landscapes and seascapes (SEPLS). This study examines how community-based governance influences conservation outcomes and resilience across protected areas, buffer zones, and adjacent community-managed territories. We combined participatory governance assessment and spatial analysis using the Integrated Management Effectiveness Tool (IMET), GIS mapping, focus group discussions, and multi-stakeholder workshops. This approach generated qualitative and quantitative evidence on governance arrangements, resource use, and landscape connectivity. Results show consistent patterns: stronger participation, clearer institutional arrangements, and better coordination are associated with more coherent landscape organization and greater connectivity. Participants highlighted customary rules and local knowledge as key to regulating resource use and supporting climate adaptation. This research proposes a framework for assessing protected areas as integrated socio-ecological systems and offers insights for scaling community-based conservation.

Osteological Insights into the Diversity of Scolecophidians of the Western Ghats

Midhuna Radhakrishnan

Kannur University, Kerala, India; Natural History Museum, London, UK

Abstract:

Scolecophidian snakes are a taxonomically intriguing group of snakes. Their small size, burrowing habit and conserved morphology pose a challenge in identifying species and make their diversity studies extremely difficult. In the Western Ghats of peninsular India, these fossorial snakes are very sensitive to land use change as they occupy the vulnerable microhabitats. The current gap in the taxonomic study directly affects the conservation planning in this biodiversity hotspot. My PhD project combines the high-resolution osteological data of new Scolecophidian specimens from the Western Ghats and old collections from the Natural History Museum, London, for describing the osteological characters, and thereby contributing to reevaluating their morphological diversity. High-resolution Micro-CT scan of cranial and vertebral elements will overcome the previous limitation in the identification of species (using very few external diagnostic characters) and reveal unrecognised taxa. I identified a new species from the Western Ghats and I am currently working on generating osteological data for multiple South Asian species including the hitherto undescribed species. By illustrating how osteology overcomes the limitation of traditional morphological features, this study enhances the taxonomic framework for distribution mapping, threat assessment and conservation of the group.

Cross-Taxa Wildlife Disease Patterns as Bioindicator of Ecosystem Stress

Rahman, Anisah

Stuyvesant High School, Astoria, NY, USA

Abstract:

Environmental change increasingly impacts wildlife health, yet disease is still an underutilized tool for conservation monitoring. This study explores whether patterns in wildlife disease can function as bioindicators of ecosystem stress. This study examines pathological evidence across systems, including fossil assemblages and modern vertebrate populations, in order to identify common patterns linking disease to environmental conditions, using a comparative literature synthesis. Disease has long been shaped by both intrinsic and environmental factors, as demonstrated by paleopathological studies, highlighting challenges such as distinguishing true pathology from taphonomic alteration. Variation in disease prevalence and severity has been associated with anthropogenic stressors in modern systems, which suggests that health outcomes reflect broader ecological disturbance. Mechanistically, environmental stress consistently disrupts immune function, as identified by principles from eco-immunology. Synthesis suggests that disease responses show consistent patterns across taxa under environmental stress, supporting their use as measurable indicators of ecosystem health. Integrating prehistoric wildlife health data into conservation frameworks can improve early detection of ecosystem disturbance and prompt management strategies, such as earlier detection of modern ecosystem disturbance serving as a catalyst for informed conservation decision-making.

Niche Differentiation and Habitat Suitability of Two Chameleon Species in Madagascar

Hajaniaina Rasoloarison, Bernard Randriamahatantsoa, Nirhy Rabibisoa

Université de Mahajanga, Mahajanga, Madagascar

Abstract:

Furcifer labordi and *Furcifer antimena* are two threatened chameleon species endemics to southwestern Madagascar. Knowledge of their ecological needs remains limited, thereby constraining the development of effective conservation strategies. This study aims to better assess their ecology and distribution using ecological niche modelling approaches. Ecological niche and habitat suitability were evaluated using species distribution models based on the ensemble of small models (ESM) approach. In parallel, a factor analysis of ecological niches (ENFA) was conducted to quantify habitat and selection patterns. Nine ecological variables, including topographic, hydrological, and vegetation structure descriptors, were selected for the analyses. Population density was then estimated using the distance sampling method, resulting in the recording of 75

individuals of *F. labordi* and 625 individuals of *F. antimenae*. The results reveal a clear segregation of ecological niches between the two species along a vegetation structure gradient. *Furcifer labordi* exhibits a narrow ecological niche primarily driven by elevation, proximity to water resources, and vegetation productivity, while its marginal niche is associated with low elevations and heterogeneous vegetated habitats. *Furcifer antimenae* shows similar responses to the main environmental gradients, but its marginal niche is more strongly associated with low elevations and more open or heterogeneous habitats. This habitat partitioning reduces niche overlap between the two species and suggests a coexistence mechanism based on spatial differentiation of habitat use.

Cell Wall Dynamics of Beech Leaf Disease

Peyton Redinger, JD Lewis

Fordham University, Bronx, NY, USA

Abstract:

Beech leaf disease (BLD) is an emerging threat affecting *Fagus grandifolia* across northeastern North America. The disease is caused by the foliar nematode *Litylenchus crenatae mccannii*, which induces characteristic leaf banding, crinkling, and gall-like deformation associated with abnormal mesophyll expansion. The foliar damage is associated with detrimental effects on photosynthesis, soil dynamics, and forest health. Despite its rapid spread and ecological impact, the basis of host response to infection remains poorly understood.

The plant cell wall is a dynamic structure central to defense, growth, and stress response. Its composition—particularly pectins, hemicelluloses, and cellulose—can reflect how plants respond to parasitic invasion and tissue damage. This study investigates how cell wall composition changes during BLD progression to better understand host–parasite interactions at the tissue level.

Buds and leaves of *F. grandifolia* were sampled throughout the growing season and analyzed using immunofluorescence microscopy targeting key cell wall polymers. Spatial and temporal variation in pectin, hemicellulose, and cellulose composition were assessed to identify patterns associated with infection and symptom development. These results provide insight into the cellular mechanisms underlying BLD and contribute to a broader understanding of plant defense responses with implications for forest conservation and management.

Evaluating the Relationship Between Pollen Production and EcoValue at Spelman College

Courtney Alana Roberts, Nicole K. Johnston

Abstract:

Spelman College is home to over 800 trees, serving as an urban oasis within Fulton County. These trees improve air quality by absorbing particulate matter and other pollutants. However, while contributing to environmental health, they also produce significant amounts of pollen during peak seasons, leading to allergy-related consequences among students and staff. This highlights a critical-trade off between ecological benefits and student health impacts. The study's purpose is to investigate current pollen production on Spelman College's campus and compare it to the total ecological value (EcoValue) of individual trees. A pilot study was conducted to build a model to calculate annual pollen output of trees on Spelman's campus. *Acer Rubrum's* (Red Maple) annual pollen output was calculated using tree diameter at breast height (DBH) and a published equation for pollen production and computed pollen output for individual trees. This data was then compared to the EcoValue of individual trees (estimated using i-Tree equations) using a linear regression. 5 trees fit the criteria for the study and produced a total output of 481041.94×10^9 pollen grains. Connections between tree planting and allergies have been a recent area of research and this is the first study of its kind at Spelman College. Future work will expand this model to include more tree species, allowing for broader comparisons and supporting the goal of presenting more balanced suggestions of what trees the campus should plant next.

Animal House: Uncovering Humans' Biases of Animals Through Enclosure Evaluations

Nicholas Rose, Kristy Biolsi

Marist University, Poughkeepsie, NY, USA

Abstract:

Past research has established that humans' judgments of captive animal welfare are differentiated depending on various factors, such as animal activity levels, observation of species-specific behaviors, and enclosure size (Miller et al., 2018; Bexell et al., 2007). More recently, the Stereotype Content Model—originally developed by Fiske et al. (2002) to describe social perceptions of humans—has been applied to human-animal perception and used to assess humans' empathy levels towards different animal species (Sevillano & Fiske, 2016; Swim et al., 2023). These more recent findings suggest there may be additional factors driving humans' perceptions of animal welfare. The current study combined these two lines of research to investigate whether animal stereotypes, based on competence and warmth, affected how adults perceived animals' welfare in an enclosure. Participants were split into three groups based on enclosure quality (sub-standard, standard, or above-standard), shown images of the enclosures, and asked to assess the quality of each. Results indicated that individuals feel animals

with high competence/warmth need more from their enclosures than other animals. Interestingly, participants seemed to be more critical of sub-standard enclosures when the animal species was highly rated in only one attribute (when compared to both or none), prompting further investigation into what mechanisms are at play aside from empathy. In the future, this work can be utilized to improve the perception of zoos/aquariums and correct public misconceptions about animal welfare.

Cities as Habitat: The Role of Green Infrastructure on Avian Assemblages

Micah Sagar, Adam Roddy, Julia Monk
New York University, New York, NY, USA

Abstract:

Cities pose novel, extreme conditions for biota—conditions that can be detrimental and hostile to animal well-being. However, cities have also been shown to harbor many threatened species compared to non-urban counterparts, yet how cities influence biodiversity more generally remains unclear. Green infrastructure (i.e., parks, community gardens, green roofs, bioswales, and tree pits) in urban landscapes creates fractured, disconnected ecosystems that could influence biodiversity. In my study, I examine green infrastructure types across New York City to determine how their presence and density influences avian assemblages. My preliminary results show that areas with a high green infrastructure density (excluding Central Park) are more likely to foster diverse bird assemblages compared to areas with lower green infrastructure density. My continued fieldwork will aim to analyze how these bird assemblages differ among types of green infrastructure. The lack of data around biodiversity in urban landscapes hinders urban planners, architects, and ecologists from making intentional design choices which consider conservation initiatives.

Examining edge effects in a living shoreline

Abiola Saibu, Muntahi Mowla

Abstract:

Salt marshes in Jamaica Bay are degrading due sea-level rise, sediment starvation, erosion, and excess nitrogen loading. Restoration efforts include the construction of living shorelines to mitigate salt marsh loss. This study focused on the survivorship of transplanted ribbed mussels in different marsh zones within a living shoreline.

Becoming a Citizen Scientist: Defining and Measuring Citizen Science Identity

Emily Sandberg
North Carolina State University, Raleigh, NC, USA

Abstract:

Citizen science merges scientific research with participation from non-scientists, often tasking participants with data collection, classification, and reporting for large-scale projects spanning multiple study sites. Prior studies of these participants have identified demographic trends, measured learning outcomes, and assessed changes in science literacy and pro-environmental behaviors. Yet, little is known about whether participants develop an identity as a citizen scientist while involved in a project, and what role this identity plays in continued engagement. Understanding citizen science identity may explain gaps in learning outcomes, motivation, and engagement within citizen science projects. Citizen science identity may also influence environmental behavior and education outcomes of participants in environment-related citizen science projects. As such, practitioners could more effectively design their programs to promote positive identity formation, sustained engagement with citizen science, and support environmental education goals. In the proposed project, we will apply several identity frameworks to understand the dimensions comprising citizen science identity and propose methods to build and validate a novel citizen science identity instrument. Once validated, we offer further studies to examine the role of citizen science identity in pro-environmental behaviors and its relationship to other established identities—namely, environmental and science identities. Ultimately, we hope to unravel the role of identity in citizen science project participation and identify potential avenues to use identity development as a tool for promoting environmental stewardship.

The Role of Connectivity in Shaping Diversity of Urban Bees

Brian Saville

Fordham University, New York, NY, USA

Abstract:

Pollination is a vital service for maintaining terrestrial ecosystems and for human food security. An increasing number of studies are assessing the well-being of pollinators in cities, which, despite urbanization's negative impacts on species richness and abundance, have the potential to harbor a wealth of pollinators even in small habitat patches such as community gardens. Bees, the most prominent group of pollinators, can succeed in small urban patches, but little is understood about the way they travel among these sites. My aims are to assess factors of urban patches that best bolster wild bee populations, and, by sampling from several sites in proximity, to assess how these factors inform the connectedness of sites within the larger urban matrix and how connectedness influences the presence of bee species at a given site. In addition to extrapolating connectivity computationally, I aim to measure it directly via genetic

analysis. I also aim to quantify the influence of connectivity on plant reproductive output. I seek to answer the following questions: 1. What factors of urban habitat patches best bolster wild bee diversity? 2. Does differential connectivity within a network shape bee species richness and composition in urban gardens? 3. Does a garden's connectedness within a network of patches influence plant reproductive output? By comparing results with those of a prior study, I can ask an additional question: 4. How has species composition in NYC community gardens changed in the past twenty years?

The Effects of Human Disturbance on Coastal Insect Biodiversity

Kelissa Lochan, Naziah Lynch, Zara Savitsky

Abstract:

Coastal insects are important to beach, dune, and riverbank ecosystems. Their populations can decline because of human activities. Habitat loss, pollution, recreation, and invasive species can reduce insect biodiversity. Coastal insects are especially sensitive to changes in their environment. This study compares protected and human-disturbed areas to see how human activity affects insect biodiversity.

Community-Defined Climate Risk in Coastal Tanzania

Clare Scheib-Feeley, Ben Taylor, Jean Mensa

Abstract:

Villages across coastal Tanzania experience increasingly frequent climate events driven by human-induced climate change, such as marine heatwaves and intensified bimodal rainfall. Ecosystem-based adaptation strategies are one way to form more resilient coastal communities, as they aim to amplify the health of marine ecosystems while protecting ocean-based livelihoods. A project led by the Wildlife Conservation Society aims to identify and implement ecosystem-based adaptation strategies in villages across coastal Tanzania with the highest climate risk. In the absence of high-resolution climate data and to support community autonomy in defining their climate experiences, data from two extensive social surveys were used to create village-level climate risk scores across Tanzania's regions of Tanga, Pemba North, and Pemba South. Each village-level climate risk score included the risk indicators of hazard, exposure, and vulnerability for five distinct climate threats. The final scores were statistically analyzed to understand geographic variation, gender and livelihood differences, and significant climate threats. The Wildlife Conservation Society targeted the villages with the highest climate risk scores for ecosystem-based adaptation projects based on the findings in

this climate risk assessment, representing a first step towards coastal climate resilience.

Effects of Climate Change on Moth Size in Central Illinois

Jordan Schindler, Anant Deshwal,
Bradley University, Peoria, IL, USA

Abstract:

The planet has been warming at a steady rate since the Industrial Revolution. Climate change can lead to changes in morphology in invertebrates, including moths. The change in size of invertebrates can be caused by changes in oxygen levels, temperature, and habitat loss, all of which have been happening in recent history. Insects play an important role in ecosystems acting as pollinators and food sources for other organisms, so it is crucial for us to understand how climate change is impacting insect morphology. This study looks at the macro-moth sizes across a wide time period in order to determine how climate change is affecting the size of the moths. Moths from Peoria and Tazewell counties have been collected using universal blacklight moth traps since the summer of 2023 and are being compared to historical samples from the Field Museum and the Illinois Natural History Survey. There are also samples that have been grown from the egg in varying temperatures, in order to test whether or not temperature is the determining factor. A digital microscope is being used to measure the pinned samples while the other samples are being hand measured. R software will be used to run ANOVA and Tukey's HSD in order to compare the forewing, hindwing, total length, thorax width, body length, and wingspan of the samples across the different time periods. We expect to see a significant change in the size of the moths from the early 1900s to now.

Decadal Analysis of the Acoustic Behavior of a Critically Endangered Whale

Julia Schles¹, Mark Baumgartner², Howard Rosenbaum^{1,3}, Melinda Rekdahl³

¹Columbia University, New York, NY, USA; ²Woods Hole Oceanographic Institution, Woods Hole, MA, USA; ³Wildlife Conservation Society, New York, NY, USA

Abstract:

Critically endangered North Atlantic right whales (NARW) exhibit dynamic movement across the western North Atlantic Ocean, including in coastal areas with intense anthropogenic activity such as the New York Bight (NYB). The NYB, an urbanized waterway characterized by shipping lanes, ongoing offshore construction, and high anthropogenic noise, has seen an increase in NARW presence over the past decade. Given the extensive anthropogenic use of the NYB and the ongoing Unusual Mortality

Event (UME) for NARW, understanding their behavior and habitat use is critical for assessing potential impacts and mitigating risk to these animals. Here, we used passive acoustic monitoring (PAM), a well-established method of monitoring that is particularly valuable for rare and/or cryptic cetacean species, to investigate NARW vocal behavior in the NYB. NARW produce stereotyped “upcalls” – frequency-modulated upsweeps produced individually or in succession that serve a social contact function and reliably indicate NARW acoustic presence. Using ten years of PAM data from the NYB, we investigated shifts in upcalls by measuring changes in parameters (frequency, call duration, inter-call-intervals, and inter-bout-intervals). These measurements allow us to assess potential trends in NARW acoustic behavior within the NYB and how they may be influenced by anthropogenic activities. Identification and contextualization of changes in NARW acoustic behavior is important for informing and improving management strategies in the NYB.

DNA Barcoding for Identification and Contextualization of Salish Sea *Ulva* Species

Stephen Crafton-Tempel¹, Sydney Schumacher², Malley Malone², Alex Costello², David Freshwater³

¹Pacific Northwest National Laboratory, Sequim, WA, USA; ²University of Washington, Seattle, WA USA; ³University of North Carolina, Wilmington, NC, USA

Abstract:

Ulva is a cosmopolitan genus of green algae, widely known as a nuisance crop in aquaculture and for its potential in blue-economy applications. *Ulva* has also been identified as a threat to marine biodiversity and marine restoration efforts, forming anoxic “green-tides” in response to nutrient pollution. Despite its ubiquitous presence and outsized importance in coastal ecosystems, identifying species within the genus is difficult due to morphological similarities between species, often shifting phylogenies. Here, we employ tuf-A DNA barcoding to identify *Ulva* species around the San Juan Islands in Washington state, and place samples within a recently reconstructed phylogenetic tree. Sampling occurred across sites ranging in anthropogenic influence, including shellfish farms, active harbors, and protected coastlines. 12 species of *Ulva* were identified from 35 samples, with morphologies ranging from monostromatic, tubular (*U. intestinales*-like), semi-tubular (monostromatic at base, bladed at ends), and distromatic blades. Species often matched previously described morphologies, but not universally, thus expanding the range of known growth-habits for certain species (such as *U. californica*). Additionally, the presence of species that are typically found in warmer climates (*U. stenophylla*) indicates potential range expansion of species under climate change. Not all samples were successfully linked to a type specimen, often due to a lack of an existing type specimen for the described species. Ultimately, this project

expands on existing surveys of *Ulva* biodiversity in the San Juan Islands and highlights the need for further phylogenetic analysis within the genus.

Ethically Scaling Up Conservation Using Synthetic Biology

Loreli Scoppettuolo, Evelyn Brister

Rochester Institute of Technology, Rochester, NY, USA

Abstract:

In October 2026, the IUCN rejected a moratorium on the use of synthetic biology (or synbio) in conservation and accepted a framework to evaluate interventions on a case-by-case basis. Synbio can provide conservationists with novel tools to support threatened species, yet only small-scale, specialized applications are in progress. To scale up synbio applications, the conservation community will need to develop specific evaluative guidelines and processes. My project uses an anticipatory governance approach to evaluate options for making conservation more effective at scale while respecting justice and ethics. This analysis identifies characteristics of synbio projects capable of meeting the framework provisions for risk assessment, consent, benefits sharing, and public engagement. First, projects deployable at scale would be those that maximize conservation benefits by managing a direct and imminent threat, such as an invasive species or pathogen. Second, initial scalable projects will most likely be in geographic areas where the public is already amenable to biotechnologies. Finally, the ethical scaling of synbio projects will most likely gain an advantage from open scientific institutions that support resource and knowledge sharing. By prioritizing these characteristics necessary for ethical applications of synbio in conservation, a clear and well-defined framework can be established to ultimately allow for scalable projects.

Green Bridges Over Troubled Waters: Myco-Agroecology in the Amazon

Ty Shelton

Columbia University, New York, NY, USA

Abstract:

Global agricultural expansion in the Amazon-Cerrado ecotone drives severe soil degradation. Highly weathered, phosphorus-limited tropical oxisols obligately rely on Arbuscular Mycorrhizal Fungi (AMF) for nutrient cycling and soil aggregation, yet the functional response of these networks to intensive management remains acutely understudied.

This field study tests the "green bridge" hypothesis in situ at the Tanguro Research Station in Mato Grosso, Brazil. We evaluate whether continuous botanical host presence—achieved via cover cropping—sustains active AMF networks across the

protracted dry season compared to traditional bare-fallow regimes.

Operating across an agricultural intensity gradient, the research quantifies AMF functional legacy through paired biochemical and physical metrics. Active network viability and energy storage are assessed via high-resolution lipid fractionation (NLFA:PLFA 16:1 ω 5), while soil engineering capacity is measured through Bradford-reactive soil compounds (BRSC) and water-stable macroaggregation. SPUN-protocol DNA metabarcoding contextualizes these functional outputs within taxonomic community shifts.

Validating the green bridge dynamic will determine if uninterrupted biological cover preserves endemic fungal networks. This isolates the mechanistic link between host carbon allocation and soil structural resilience, providing critical parameters for predictive soil carbon models to mitigate edaphic collapse in frontier agriculture.

Persistence of Mammal and Bird Fauna in Urban and Suburban Forests

Andrew Qiushi Shen, Michael Reed

Abstract:

Urban forest patches can play an important role in sustaining wildlife populations as urbanization poses threats to biodiversity. In southeastern China, the status of wildlife utilizing urban habitat patches remains understudied. From August 2022 to February 2025, we used camera traps to survey an urban forest patch, Fushan, and a suburban forest patch, Qishan, in Fuzhou City, southeastern China. This study is the first to systematically investigate the mammal fauna of Fuzhou City's urban and suburban forests. In Fushan, we recorded six mammal and 39 bird species, including six Chinese nationally key protected species. In Qishan, we recorded 11 mammal and 13 bird species, including four nationally key protected species. Mammal species richness was higher in Qishan, and observed ground-dwelling bird species richness was higher in Fushan. For both sites, the most frequently recorded mammal species was Reeves's muntjac (*Muntiacus reevesi*), and the most frequently recorded bird species was silver pheasant (*Lophura nycthemera*). Surprisingly, the leopard cat (*Prionailurus bengalensis*) was recorded for the first time in an urban forest patch as small as 405 hectares, showing stronger capacity of using fragmented habitat and transpassing urban areas than previous evidence revealed. Species compositions between Fushan and Qishan were significantly different for both mammals and birds. For almost all species shared by Fushan and Qishan, model-predicted abundance was not significantly different between the two sampling areas. This study clarified urban forest patches' capacity to support mammal and bird biodiversity, including key protected species.

Occupancy and Microhabitat Drivers of Caraboidea Occurrence in New York Coastal Sites

Yijie Shen

Columbia University, New York, NY, USA

Abstract:

The superfamily Caraboidea are ecologically important beetles, but their occurrence across New York coastal habitats remains poorly understood, especially for rare coastal specialist species. This project will combine participatory science and museum occurrence data with repeated field surveys to examine how ecological conditions and habitat structure influence Caraboidea occurrence across New York City. GBIF and iNaturalist observations will be compiled and analyzed first using a joint species distribution model to evaluate broad scale spatial patterns and relate occurrence and environmental predictors, including factors such as impervious surface cover, canopy cover, distance to coastline, and climate. Second, repeated visit field surveys using transect walks and pitfall traps will be conducted at different sites to estimate occupancy while accounting for biased sampling effort. Microhabitat variables such as substrate composition, vegetation cover, dune zone, distance to wrack and human disturbance will also be measured. The project will provide an assessment of Caraboidea occurrence across coastal habitats and test whether reference sites and more complex habitats support higher occupancy than reclaimed sites.

Soil Microbial Diversity and Nutrient Cycling after Disturbance in a Temperate Forest

Sophia Simon, Mark Ashton, Janey Lienau

Yale University, New Haven, CT, USA

Abstract:

Soil microbiota influence regeneration success, nutrient cycling, and aboveground biodiversity. Understanding how soil communities respond to disturbance is critical to manage forests for long-term resilience. In the northeastern United States, shelterwood timber harvests can emulate natural disturbances such as windthrows. Shelterwoods can alter nutrient availability and plant diversity, but effects on soil fungi and bacteria remain poorly understood. This study examines a 35-year chronosequence across 41 shelterwoods and 8 undisturbed stands in the Yale Myers Forest in Connecticut to investigate differences in soil biodiversity and nutrient cycling after disturbance. In three plots in each stand, five composite soil samples (0-10 cm) were collected and pH, water holding capacity, gravimetric moisture content, carbon (C) and nitrogen (N) content, and C and N mineralization rates were analyzed. Environmental covariates of slope, aspect, soil type, percent shrub cover, percent coarse woody debris, and data on nearby canopy

tree species were collected in each plot. Soil bacterial and fungal community composition was assessed using 16S and ITS sequencing. Bioinformatic analyses were conducted to quantify alpha and beta diversity and assign functional guilds. We expect microbial diversity and C/N mineralization rates to converge toward reference forest conditions with increasing time since harvest, and expect a decoupling of N-mineralization and nitrification rates with time since harvest. This study will inform our understanding of forest succession after disturbance, which is particularly important given the projected increase in climate-driven disturbances.

The Effects of Elevated Temperatures and Drought on Tomato Reproductive Success

Montse Sousa-Sanchez¹, Chelsea Butcher², JD Lewis¹

¹Fordham University, Bronx, NY, USA; ²Northwood University, Midland, MI, USA

Abstract:

Climate change is projected to increase global temperatures and reduce water availability, threatening plant growth and reproduction. Reproductive stages are particularly sensitive to abiotic stressors such as heat and drought, which often exacerbate each other, yet the combined effects of heat and drought on plant reproduction have not been extensively studied. Even less work has studied how combined stressors may affect plant-pollinator interactions. Tomatoes (*Solanum lycopersicum*) have a tightly controlled pollination method, where their flowers only release pollen when the anthers are vibrated, primarily by bumble bees' (*Bombus* sp.) feeding. Changes in the plant's pollen viability could therefore affect their pollinator's attraction and furthermore affect their reproductive success. To investigate the effect of climate stressors on reproductive success, NC4Grape tomato plants were grown in high (HT) or low (LT) temperatures, and further divided into drought (DS) and well-watered (WW) conditions, creating four groups: HT+DS, HT+WW, LT+DS, and LT+WW. After 60 days, plants were placed in dispersal arrays with pollen receivers at incrementally farther distances from climate treated plants. Fruits produced by pollen receivers were collected and paternity assignments were conducted to investigate pollen dispersal patterns. Preliminary results suggest that plants grown in low temperatures and saturated conditions had the most and furthest initial pollen dispersal, but the high temperature and drought conditions eventually surpassed them in both quantity and distance. This suggests that heat and drought reduce reproductive success, but given time plants are able to recover.

Colorful Cabbage: Pigmentation and Thermoregulation in Eastern Skunk Cabbage

Matthew Stanton, Joanna Coleman

Queens College, CUNY, Flushing, NY, USA

Abstract:

Flower color is typically associated with pollinator attraction, however pigments also protect plants from environmental stressors, such as extreme temperatures and UV radiation. In the case of *Symplocarpus foetidus* (the eastern skunk cabbage), color has been understudied despite the species' significant variation in spathe color, which ranges from light green to deep maroon. Furthermore, its unusual behavior as a winter blooming plant raises questions about how it protects itself from the cold. This study investigates (1) if spathe darkness plays a role in heat retention, which may protect it when emerging in winter by absorbing more solar radiation, and (2) if spathe darkness is correlated with ambient temperature across an urban gradient in and around NYC. Supplementally, I am using iNaturalist observations to identify potential latitudinal gradients in spathe pigmentation across Eastern North America. My findings may help to explain the variation in spathe color, as well as eastern skunk cabbage's response to climate change.

Tree Carbon and Stewardship on Sustainable Beef Farms in Panama and Virginia

Bela Starinchak & Heather Griscom

Abstract:

Increasing tree cover in agricultural landscapes is a critical yet underutilized strategy for meeting global conservation targets as deforestation and land degradation threaten biodiversity and carbon stocks. Sustainable pastureland management programs (SMPs) seek to support landowners in adopting conservation-oriented practices within cattle pastures, though whether enrollment translates to measurable ecological outcomes remains unclear. This study evaluated SMP-enrolled and conventional beef farms in Los Santos, Panama and Virginia, U.S.A., examining tree cover composition, tree carbon density, stocking density, woody species diversity (H'), and landowner perceptions of trees. Regardless of region, SMP-enrolled farms stored greater total tree carbon than conventional farms, though the tree cover arrangements driving this pattern differed regionally. Virginia SMP farms were dominated by hardwood fragments, while Los Santos showed comparable riparian areas across management types but lower carbon density in SMP riparian zones. H' did not differ between management types in either region. Importantly, higher tree carbon on SMP farms was not associated with reduced cattle production, suggesting conservation and production goals may be pursued together. SMP-participants also identified more benefits of trees, demonstrating the importance of individual decision-makers in driving conservation outcomes and the capacity of SMPs to foster holistic management priorities. These findings suggest that SMPs can contribute meaningfully to conservation and production

goals across regions. Future work will evaluate the ecological and social resilience of these systems to climate extremes.

Stability and Shifts in Anthropogenic Mortality of Red-tailed Hawks

Simon Stein¹, Teresa E Ely², Allen M Fish², Christopher W Briggs^{1,2}

¹SUNY College of Environmental Science and Forestry, Syracuse, NY, USA; ²Golden Gate Raptor Observatory, San Francisco, CA, USA

Abstract:

In recent decades, human-dominated environments have expanded, potentially increasing human-wildlife conflicts. These conflicts can be understood by recognizing how mortality has changed in urban species. Red-tailed Hawks are common across urban-rural gradients and may inform how causes of death have shifted with increasing urbanization. We banded migrant Red-tailed Hawks near San Francisco, CA from 1984-2022. When individuals were encountered dead, we classified them based on cause of death and predicted that overall anthropogenic mortality causes would increase over time. Proportion of impervious surfaces was estimated for each mortality within 1 km² as a metric of urbanization. Of the 657 Red-tailed Hawks encountered, 352 (54%) had unknown causes of mortality, limiting inference about absolute mortality patterns. 187 deaths were from anthropogenic causes with the largest category being vehicle collisions (n = 96). While there was no change in overall anthropogenic mortality, certain mortality types, such as electrocution, decreased (Estimate = -0.04 ± 0.02 P = 0.05). The analysis detected relationships between anthropogenic threats and age as immature hawks died from anthropogenic collisions more often than adults (Estimate = 0.87 ± 0.32 , P = 0.006). Window collisions had a strong positive relationship with fraction impervious surface (Estimate = 0.036 ± 0.01 , P = 0.0002). Understanding how major threats to Red-tailed Hawks change over spatiotemporal scales can inform how species adapt to urban environments and how anthropogenic threats affect mortality.

Investigating the Spatial and Temporal Variation of Great Lakes Piping Plover diet

Yi Fang Tan, Sushma Reddy, Francesca Cuthbert

University of Minnesota, St Paul, MN, USA

Abstract:

Food resources are a significant contributor to reproductive success, survival, and ultimately the growth of a population. The diet composition of a species can vary within populations depending on prey distribution across the landscape, and may be governed by individual preference or nutritional needs as well as foraging experience or competition. Accurate assessments of diet breadth and composition, as well as how

diet changes over time, are crucial for understanding basic ecology of a species and for inferring mechanisms driving variation in diet composition within a population. In this study, we use a multi-marker metabarcoding approach to characterize the diet of an endangered shorebird population, the Great Lakes Piping Plover (*Charadrius melodus*), throughout its breeding range. We also investigate spatial, age and sexual variations in its diet. Using markers from two genomic regions (16S and COI), we analyze fecal samples collected from Great Lakes Piping Plovers during the 2020-2025 breeding seasons. We expect that the Great Lakes Piping Plover diet will vary spatially and temporally, reflecting differences in prey availability across landscapes. We also expect high dietary overlap between sexes, owing to similar foraging behavior and parenting strategies over the breeding season. Results from this research will identify important food items that influence survival and fitness for each life stage across the landscape, and determine if diet composition is relatively static or dynamic over time.

Natural Enemy Impacts on Seedling Regeneration at Forest Edge Versus Interior

Alma L Trujillo-Miranda¹, David Cantos², Jordan Karubian^{2,3}, Liza S Comita^{1,4}

¹Yale University, New Haven, CT, USA; ²Fundación para la Conservación de los Andes Tropicales (FCAT), Quito, Ecuador; ³Tulane University, New Orleans, LA, United States;

⁴Smithsonian Tropical Research Institute, Panamá City, Panamá

Abstract:

Plant-enemy interactions are context-dependent, suggesting that fragmentation can differentially modify natural enemy pressure along edge-interior gradients, weakening some interactions while intensifying others. To provide a biotic mechanistic understanding of edge effects in plant regeneration, we experimentally evaluated how natural enemies (vertebrates, insects and fungi) influence seed germination and seedling establishment of two shade-tolerant tropical plant species, *Prestoea decurrens* and *Synechanthus warscewiczianus*, in forest edges and interiors within a highly fragmented landscape in Choco Forest in northwestern Ecuador. Using an enemy-exclusion experiment, we manipulated access of natural enemies at n= 13 paired edge (0-10 m) and interior forest (90-100 m) sites, monitoring seed germination (radicle emergence) and seedling establishment (development of epicotyl and roots) weekly over five months. Germination and establishment were consistently higher in the forest interior for both species, highlighting strong negative edge effects on early recruitment. Insects emerged as the primary natural enemies; they negatively impacted the regeneration of *P. decurrens* in both edge and interior habitats, whereas for *S. warscewiczianus*, the impact was restricted to the forest interior. Conversely, fungi and vertebrates had no detectable effects. Our findings demonstrate that forest edge and

biotic filtering by insect predation can filter out understory plant species in forest remnants, reducing recruitment potential in fragmented landscapes.

Assessing Rancher Attitudes Toward Large Carnivores in the Amazon Lowlands

Rachel C Warner¹, Soham P Mehta¹, Juriko Rupay Valdivieso², Fabiola La Rosa-Camino², Viorel D Popescu¹, Ruth S DeFries¹

¹Columbia University, New York, NY, USA; ²World Wildlife Fund, Perú, Lima, Perú

Abstract:

Managing human–wildlife interactions in heterogeneous landscapes is essential for balancing conservation goals with local livelihoods. However, generalizing management strategies across landscapes remains challenging due to the complex social dimensions of human–wildlife conflict. Understanding local attitudes toward wildlife and their management is thus critical for anticipating behaviors that may lead to negative interactions. To examine these dynamics, we surveyed 110 cattle ranchers in Madre de Dios, Peru, a region of the southwestern Amazon where jaguars (*Panthera onca*) and pumas (*Puma concolor*) commonly prey on livestock. We assessed the spatial patterns and determinants of rancher attitudes across multiple dimensions, including depredation concern and prevention, tolerance toward predation, lethal control, and carnivore conservation. Specifically, we (a) mapped the spatial patterns of attitudes, and (b) modeled their demographic and socioeconomic predictors. Our preliminary results reveal that spatial clustering varies across attitudinal responses and that demographic and socioeconomic factors are differentially associated with each. Among these attitudes, depredation concern exhibited the strongest spatial clustering along two provinces in the study region and was significantly associated with the history of livestock predation. These findings highlight both the heterogeneity and clustering of attitudes towards large carnivores. As such, integrating local attitudes into conservation planning can strengthen community-centered approaches to mitigating conflict and promoting coexistence.

Tufted Puffin, *Fratercula cirrhata*, Diet Monitoring in Northern Oregon

Jayden Washington Samuels¹, William Kennerley², Rachael Orben², Rita Mehta¹

¹University of California, Santa Cruz, Santa Cruz, CA, USA; ²Oregon State University, Newport, OR, USA

Abstract:

Tufted Puffins (*Fratercula cirrhata*; TUPU) are a diving seabird species. During breeding season, pairs excavate burrows on isolated islands or sea stacks and raise a single chick, provisioning them with whole, intact prey carried in the bill. These “bill loads”

offer a relative measure of marine prey abundance and parental provisioning success. Observations at Oregon's Haystack Rock colony may help explain population declines across the California Current Marine Ecosystem – Oregon's TUPU population has fallen from ~5,000 individuals in 1988 to less than ~600 in 2021. Using non-invasive photographic sampling over ~30 days per season across four summers (2022–2025), we quantified bill loads during early July through mid-August. We counted and identified prey in photographs and estimated sizes relative to puffin bill length. Approximately 853 bill loads were recorded, comprising prey from Clupeidae, Osmeridae, Gadidae, squid, and unidentified larval fish. Despite interannual variation, all prey types were represented each year. Provisioning rates ($\text{fish} \cdot \text{h}^{-1}$) showed high intra- and interseasonal variability, and concurrent shifts in diet composition may indicate nutrient compensation. While prey quality is known to influence breeding success in some seabird species, the direct effects of this dietary interannual variation on Haystack Rock TUPUs remain unclear. We plan to calculate the energetic value of bill loads to determine whether variation in provisioning rate is offset by selection for energy-rich prey.

Microplastic Bioaccumulation in Marine Copepods: An Accessible Approach

Christina Weber

Brookdale Community College, Lincroft, NJ, USA

Abstract:

Plastic pollution is a widely known environmental issue, yet the research of microplastics (MPs) is in its infancy. This is of particular concern in marine ecosystems, which suffer from higher levels of plastic pollution. Through environmental, chemical, and physical processes, plastic pollution breaks down into MPs, or plastic fragments measuring under 5 millimeters. Marine copepods, one of the most abundant zooplankton, support nearly every marine food web. Both in their natural environment and laboratory settings, marine copepods have been observed to ingest MPs. However, the extent to which MPs affect marine copepods is not fully understood, nor are there standardized research protocols for studying this phenomenon. Current literature employs extensive use of methods that are both expensive and inaccessible outside of research-heavy institutions.

Here we show a method that not only investigates MP bioaccumulation in marine copepods, but also develops research protocols accessible with limited funding and resources. By building custom equipment (a low-cost fluorescent imaging setup and simple plankton wheel) and using relatively accessible reagents, we found *Tigriopus californicus* marine copepods more likely to consume polystyrene microspheres when phytoplankton availability was scarce. This method, established with only a few hundred

dollars at a community college laboratory, allows for MP bioaccumulation to be researched in a wider range of settings, including by community scientists. The concern of MP bioaccumulation in marine ecosystems is constantly growing, highlighting the importance of this research beyond typical financial and equipment-related constraints.

Stable Isotope Analysis of Food Webs in Albanian Caves

Xhanina Weitersshagen

Georg-August University of Göttingen, Göttingen, Germany

Abstract:

Cave ecosystems are shaped by environmental conditions and range from typical caves to more extreme systems such as sulfur-rich caves. These differences influence food web structure, energy sources, and species composition. This study examines small animal communities in different cave systems in Albania, including sulfur caves. The aim is to understand how these food webs are organized, which ecological niches are present, and how environmental conditions influence species interactions. Stable isotope analysis of carbon and nitrogen was used to measure isotopic signatures in animal tissues and to infer feeding relationships within the food web. Based on approaches used in sulfur cave systems, this method helps identify primary energy sources and the role of chemoautotrophic microorganisms. Differences in isotopic signatures between species provide insight into feeding strategies and the presence of distinct ecological niches.

Investigation of Fish Communities Around Oyster Aquaculture Farms in Peconic Estuary

Jenna M White, Bradley J Peterson

Stony Brook University, Stony Brook, NY, USA

Abstract:

Oyster farming is becoming increasingly important in Long Island and is helping to address the world's growing appetite for seafood. However, the impact of aquaculture equipment on local fish populations is still unknown. This research aimed to determine the diversity and abundance of fish around benthic and floating oyster equipment in Little Peconic Bay and identify which type of equipment had the greatest number of fish. Additionally, this research aimed to determine the presence of fish over time. Time-lapse cameras were used to collect data from July 8 to August 13, 2025. Four Brinno TLC300 cameras were used to monitor floating and benthic cages, as well as a natural control in Peconic Bay. Fish diversity was measured using the Shannon-Wiener index, and MaxN was used to estimate fish abundance. Fish abundance across equipment

types was analyzed using a binomial GLM with benthic equipment as the reference. Fish diversity was slightly higher around floating cages, indicating a wider range of species utilizing elevated structures in the water column. Fish abundance was also slightly higher at floating cages but showed greater variability, whereas benthic cages supported more consistent fish presence. Despite lower diversity, fish exhibited a slightly greater association with benthic cages, suggesting these structures provide more reliable habitat, likely due to increased shelter and localized food resources. These findings indicate that oyster aquaculture gear can function as habitat, with floating cages enhancing diversity and benthic cages supporting more stable fish assemblages.

Estimating Bear Abundance from Noninvasive Genetic Monitoring: A Synthesis

Marcella Willett¹, Mihai Pop², Ruben Iosif³, Viorel Popescu¹

¹Columbia University, New York, NY, USA; ²Association for Biodiversity Conservation, Focșani, Romania; ³Foundation Conservation Carpathia, Brasov, Romania

Abstract:

Noninvasive genetic monitoring is a powerful tool for conservation and wildlife management and has been growing in popularity as a relatively cost-effective and accurate method of estimating population sizes, particularly in large carnivores, such as bears. This study conducts a meta-analysis of noninvasive genetic monitoring studies using scat and hair samples in brown and black bear (*Ursus arctos* and *U. americanus*) populations over the past 10 years from across their ranges in North America, Europe, and Asia. Data were extracted from 109 studies on sampling methods, study area, number of samples analyzed and successfully genotyped, number of individuals identified, sex ratios, and population estimates. Preliminary results indicate that genotyping success rates tended to be higher for hair than for scat, with scat sampling increasing in genotyping success over time, but hair sampling remaining relatively constant. Studies were inconsistent in how or if recapture rates were reported, but comparison of numbers of genotyped samples and individuals identified showed that studies using scat samples tended to identify more unique individuals relative to the number of genotyped samples. Of the studies estimating population size or density, 30 used spatially explicit capture-recapture models, while 27 used non-spatial models. Population density estimates varied widely between 23-840 bears per 1000 km² for black bears and 0.7-186.6 bears per 1000 km² for brown bears. This analysis can serve as a baseline of comparison for future studies to evaluate the plausibility of density estimates and improvements in the efficacy of genetic monitoring methods for brown and black bears.

Estimating Snow Leopard (*Panthera uncia*) Density in Annapurna Conservation Area, Nepal

Durga Nanda Yadav¹, Rabin Kadariya², Oswald J Schmitz¹

¹Yale University, New Haven, CT, USA; ²National Trust for Nature Conservation, Kathmandu, Nepal

Abstract:

Snow leopards (*Panthera uncia*) are listed as Vulnerable on the IUCN Red List, yet reliable population estimates remain scarce across much of their range, including the Annapurna Conservation Area (ACA) of Nepal. Understanding local population density is critical for informing conservation planning, yet camera trap-based demographic assessments are rarely conducted in this landscape. This study presents the first spatially explicit capture-recapture (SECR)-based density estimates for snow leopards in the ACA in the central Himalaya of Nepal. 148 camera traps across 75 grids in the Manang and Mustang districts of the ACA were deployed from April to August, generating 5,610 trap nights. Using pelage patterns for individual identification, 13 individuals in Manang and 10 in Mustang districts were identified. Null SECR models with constant detection and movement parameters were applied to estimate density, capture probability (g_0), and spatial scale of movement (σ). Density was estimated at 2.06 individuals/100 km² (95% CI: 1.55–3.04) in Manang district and 1.29 individuals/100 km² (95% CI: 0.93–2.67) in Mustang district, with realized population estimates of 18 (95% CI: 14–37) and 13 (95% CI: 11–26) individuals, respectively. While these results provide a baseline assessment of snow leopard density and abundance in the ACA, future surveys should prioritize camera layouts that maximize spatial recaptures, longer deployment periods across the seasons, and inclusion of habitat covariates to improve the reliability of SECR-derived estimates and support evidence-based snow leopard conservation in the Himalayas.

Multidimensional Community Compositional Change Along an Urbanization Gradient

Jianchao Liang¹, Zhenzhou Xu², Qiongyue Zhang^{1,3}, Hui Li², Huijian Hu¹

¹Guangdong Academy of Sciences, Guangzhou, Guangdong, China; ²South China Agricultural University, Guangzhou, Guangdong, China; ³Henan Normal University, Xinxiang, Henan, China

Abstract:

Urbanization profoundly reshapes biological communities, yet how multi-dimensional community composition changes over time along urbanization gradients remains poorly understood, largely due to the limitations of space-for-time substitution approaches. Using Guangzhou, a rapidly expanding megacity in southern China, as a case study, we

used true time-series data from fixed transects surveyed in 2005 and 2023 to assess patterns and drivers of avian temporal beta diversity across taxonomic, phylogenetic, and functional dimensions along an urbanization gradient. Our results showed that: (1) temporal beta diversity across all three dimensions exhibited a significant hump-shaped pattern along the urbanization gradient, primarily driven by nestedness rather than turnover components, with colonization contributing significantly more than extinction, indicating that community change at intermediate urbanization was characterized by species gain-driven subsetting rather than species replacement; (2) dimensional asynchrony was detected, with the functional peak shifting toward higher urbanization intensity, likely attributable to the buffering effect of functional redundancy; (3) the dominance of deterministic processes underwent a non-linear shift along the gradient with notable dimensional differentiation – taxonomic and phylogenetic dimensions significantly deviated from random expectations, whereas the functional dimension did not; and (4) landscape configuration change was identified as the most important direct driver of multi-dimensional temporal beta diversity, while landscape composition exerted indirect effects mediated through landscape configuration.

Mean Annual Temperature Shapes Distribution of Ibisbill in Northwestern Himalayas

Iqram Ul Haq¹, Khursheed Ahmad¹, Asad R Rahmani²

¹SKUAST-Kashmir, Shalimar, New Theed, Jammu and Kashmir; ²Senior scientific advisor BNHS-Mumbai, Mumbai, India

Abstract:

The Ibisbill (*Ibidorhyncha struthersii*) is a cryptic high-altitude shorebird whose distribution remains poorly understood, particularly in relation to climatic constraints. Identifying areas of climatic suitability is essential for assessing the vulnerability of understudied montane species under climate change. We used an ensemble species distribution modelling approach with six bioclimatic variables to estimate current climatic suitability and project future changes across the Northwestern Himalayas. Weighted mean and committee averaging ensemble methods showed high predictive performance (AUC = 0.976 and 0.96; TSS = 0.893 and 0.89, respectively), supporting their reliability for climate-based projections. Among the predictors, mean annual temperature was the dominant driver, accounting for approximately 60% of relative importance, whereas other temperature- and precipitation related variables contributed comparatively little to explaining the species' distribution. Future projections indicate a net expansion in the area subject to suitable climatic conditions, particularly along mid-elevation river corridors. By focusing exclusively on climatic variables, this study provides a first-order assessment of climate-driven constraints on the distribution of a

specialized montane riverine bird and establishes a baseline for long-term conservation planning, monitoring, and climate-adaptive management in Himalayan river systems.