2023 Northeast Natural History Conference Poster Abstracts

Listed in alphabetical order by first-listed author/presenter. Code at the bottom of each abstract indicates when in the conference schedule the presentation will be given: Day -Poster # (thus, for example, Sun-21 indicates the presentation will be poster #21 in the morning and afternoon Sunday poster sessions).

Death from Below! Effects of Non-native Earthworms in Deciduous Forests

Bridget Abney (University of Massachusetts Lowell, Lowell, MA), Alison Hamilton (University of Massachusetts Lowell, Lowell, MA), and Joy Winbourne (University of Massachusetts Lowell, Lowell, MA)

Abstract - We conducted a study measuring the carbon flux caused by the breakdown of leaves by *Amynthas agrestis* (Asian Jumping Worm) and *Lumbricus terrestris* (European Earthworm). This study followed the effects of the worms on deciduous forests by measuring the breakdown of leaf litter, *Acer* (maple) and *Quercus* (oak) leaves, through the tracking of mass, visual observations, and output of CO_2 generated in a controlled, simulated environment. Though this research is ongoing, we believe it is essential to measure the effects of these worms because the Asian Jumping Worm is an invasive species that may have detrimental effects on deciduous forests within the Northeast. By collecting this data, we hope to gain a better sense of the ability of each of these worms to process forest litter, in order to see what some of the impacts might be of possible movements and infestation as these worms eventually settle in New England.

Sat- 9

Bugs in Bogs: Insect Biodiversity Within a Boreal Peatland at the Southern Range Limits of the North American Boreal Temperate Ecotone

Annie Arnold (SUNY Plattsburgh, Plattsburgh, NY), Timothy Mihuc (SUNY Plattsburgh, Plattsburgh, NY), Stephen Langdon (Shingle Shanty Preserve and Research Station, Adirondack Park, NY), and Mark Lesser (SUNY Plattsburgh, Plattsburgh, NY)

Abstract - Boreal peatlands provide unique characteristics in hydrology, vegetation, and soil chemistry whose functionalities support greater biodiversity and environmental significance to other ecosystems. Climate has the greatest impact on these characteristics, and studies conducted within the North American Boreal Temperate Ecotone (BTE) show a shift in boreal temperate forest ecotones to higher latitudes due to climate change, resulting in tree encroachment which threatens the existence of these rare ecosystems. Invertebrates within a boreal peatland are important bioindicators to climate change as they are critical to food-web composition and are easily impacted by changes in temperature. In this study, we will collect invertebrates along an open-to-forested peatland gradient at the Shingle Shanty Preserve, in west-central Adirondacks of Upstate New York and at the southern range limits of the North American BTE. The objectives of this study are to (1) create a catalog of insect biodiversity along the open to forested bog gradient, (2) consider how insect biodiversity is influenced directly by changing climate (i.e., warming), and (3) consider how insect biodiversity is indirectly influenced by changing climate (i.e, tree encroachment, arthropod abundance). We will also consider potential ecological relationships within the preserve, specifically research on boreal bird species, and more generally examining the potential connectivity to changing abiotic and biotic factors. During 2023 and 2024, we will place traps along transects spanning the open-to-forested bog gradient in late May and then collect and reset traps in mid-July, late August, and early October to account for temporal changes in community composition. We will sample ground- and soil-dwelling insects using Berlese funnel samples and sweep netting in each plot. We will sample tree- and snag-dwelling insects using sticky traps affixed to trees at 1.3 m height. In open-bog plots where no trees are present, we will place sticky traps on a 1.3-m stake. All insect samples will be identified at SUNY Plattsburgh. Understanding how tree encroachment affects biodiversity in boreal peatlands is essential for sound management practices and conservation of these sensitive ecosystems.

Sun- 32

Picture This: Wildlife Habitat Suitability Across a Chronosequence of Wildfire-Origin Stands at a Jack Pine Barrens

Meghan Bargabos (SUNY Plattsburgh, Plattsburgh, NY), Casey Halloran (SUNY Plattsburgh, Plattsburgh, NY), Zachary Hart (SUNY Plattsburgh, Plattsburgh, NY), Danielle Garneau (SUNY Plattsburgh, Plattsburgh, NY), and Mark Lesser (SUNY Plattsburgh, Plattsburgh, NY)

Abstract - Research on wildlife's response to wildfire in fire-dependent pine barrens is limited. In the northeastern United States, pine barrens ecosystems are often relatively small landscape patches nested within a matrix of northern hardwood forest with low burn frequency. Thus, pine barrens not only represent a unique habitat type for wildlife at the landscape scale, but also may contain varied forest patches of differing stand age and structure based on their disturbance history. Wildlife may, in turn, respond in their use of this habitat mosaic that is experiencing patch-level successional differences in forest structure and composition since the wildfire disturbance. The objective of this study was to quantify wildlife habitat suitability across a fire-dependent *Pinus banksiana* (Jack Pine) sandstone pavement barrens in northeastern New York. The Altona Flat Rock is a ~2000-ha pine barrens dominated by Jack Pine interspersed with, and surrounded by, northern hardwood forest. Over the past century, areas of the Flat Rock have experienced wildfire in 1919, 1940, 1957, and most recently 2018, resulting in a chronosequence of stand-origin ages. Beginning in September 2022, we established a network of twenty 1-km^2 grid-cells spanning the Flat Rock and surrounding hardwood forest. We positioned a camera trap in the center of each grid cell to continuously monitor wildlife. Additionally, we randomly selected 3 locations within each grid cell to determine forest structural attributes (e.g., density, basal area, canopy closure, understory composition, and abundance of coarse woody debris) and stand age. Preliminary results show that *Odocoileus virginianus* (White-tailed Deer), *Canis latrans* (Coyote), *Lynx rufus* (Bobcat), and *Lepus americanus* (Snowshoe Hare) are some of the most frequent occurrences, with White-tailed Deer, in particular, having been found at every camera site at high abundances. We aim to continue monitoring camera traps over the course of 2023. Wildlife occurrence data will be used in conjunction with forest structure data to build species-specific occupancy models. These results will provide critical information for ecologically sound management (i.e., frequency and extent of burning) of this globally rare pine barrens.

Sun- 10

Emerging Vector-borne Pathogens in Northeastern US Cervids

Lauren Berkley (University of Vermont, Burlington, VT), Ellen Martinsen (University of Vermont, Burlington, VT), Nathan Bieber (Maine Department of Inland Fisheries and Wildlife, Augusta, ME), Josh Blouin (University of Vermont, Burlington, VT), Jacob DeBow (University of Vermont, Burlington, VT), Therese Donovan, (University of Vermont, Burlington, VT), Caitlin Drasher (University of Vermont, Burlington, VT), Martin Feehan (Massachusetts Division of Fisheries and Wildlife, Westborough, MA), Dylan Ferreira (Rhode Island Department of Environmental Management, Providence, RI), Nick Fortin (Vermont Department of Fish and Wildlife, Montpelier, VT), Rebecca Furda (New Hampshire Fish and Game Department, Concord, NH), Henry Jones (New Hampshire Fish and Game Department, Concord, NH), Pauline Kamath (University of Maine, Orono, ME), Lee Kantar (Maine Department of Inland Fisheries and Wildlife, Augusta, ME), Andrew Labonte (Connecticut Department of Energy and Environmental Protection, Hartford, CT), James Murdoch (University of Vermont, Burlington, VT), Elias Rosenblatt (University of Vermont, Burlington, VT), Inga Sidor (New Hampshire Veterinary Diagnostic Lab, Durham, NH), and Alaina Woods (University of Maine, Orono, ME)

Abstract - Emerging infectious diseases pose an increasingly severe threat to wildlife populations around the world. Vector-borne diseases are of particular concern as arthropod vectors rapidly move northward with climate change, thus exposing northerly restricted and immunology-naïve species to novel pathogens. The understudied blood parasites *Babesia odocoilei*, *Theileria cervi*, and *Plasmodium odocoilei* pose a threat to northern cervid populations such as *Alces alces* (Moose) and *Rangifer tarandus* (Caribou). In this study, we sampled cervids including *Odocoileus virginianus* (White-tailed Deer), Moose, and captive Caribou across the northeastern US for the tick-borne pathogens *B. odocoilei* and *T. cervi,* and the mosquito-borne malaria parasite *P. odocoilei*. We sought to establish foundational knowledge on the prevalence and geographic distribution of *B. odocoilei, T. cervi,* and *P. odocoilei* in northeastern US cervids. By forging collaborations with every state fish and wildlife agency in New England, as well as veterinarians, we obtained hundreds of tissue samples from Deer, Moose, and Caribou. By PCR, we found positive samples for *B. odocoilei* and *T. cervi*, including *B. odocoilei* in captive Caribou and *T. cervi* in free-ranging White-tailed Deer. This study aims to uncover the demographic and ecological drivers of cervid pathogen prevalence and distribution. The ultimate goal is to inform the decisions of wildlife managers, conservation biologists, veterinarians, and livestock owners to mitigate the impact of emerging infectious diseases in northern wildlife populations and livestock.

Sun- 36

Comparing Methods of Data Collection on the Diverse Morphological Features of Bat Dentition

Angela Bird (Bridgewater State University, Bridgewater, MA) and Maria Armour (Bridgewater State University, Bridgewater, MA)

Abstract - In this research project, I created camera-lucida drawings, naked-eye drawings, and stereomicroscope photographs of the skulls of 7 different bat (Order: Chiroptera) species to analyze and compare their qualitative and quantitative data results. The camera lucida is a classical optical device designed to produce scientific images, superimposing study subjects onto paper to be traced by the researcher. Scientific images have been integral in the sharing of knowledge within the scientific community and are often used to communicate complex research results to the public. Detailed, scientifically accurate visuals (drawn, rendered, or digital) present the research organism in a more easily comprehensible way than can be relayed solely with descriptive writing. The utilization of visuals in scientific manuscripts can quickly communicate complex and detailed morphological data. Over the last few decades, a variety of visualization methods have been utilized. Each method emphasizes discrete aspects of morphology; some are more effective at communicating qualitative results, while others are better at communicating quantitative results. These differing strengths and weaknesses between the methods of visualization may be unfamiliar to researchers, potentially resulting in a choice of figures that lack clarity and precision. To help researchers clarify what visualization methods work best for them, this project compares different methods of both qualitative and quantitative data collection using morphological dental features of 7 different bat species. The dentition across the bat Order shows a wide variation in morphology due to the highly variable diets among and within bat families. This variation makes bats ideal subjects for comparison of visual methodology. This research project compares self-created naked-eye and camera-lucida drawings, and stereomicroscope photographs using CellSens imaging software, along with open-source and prior-literature results of CT scans and 3D images. We compared these visualization methods for their strengths and weaknesses offered to both qualitative and quantitative results. As we predicted, camera-lucida drawings show superior qualitative results, while the CellSens images exhibit superior quantitative results.

Sun- 20

The Use of a Novel Camera Trap to Detect Small Mammals

Vincenzo Bonaiuto (SUNY Potsdam, Potsdam, NY), Glenn Johnson (SUNY Potsdam, Potsdam), NY, Katherine Cleary (SUNY Potsdam, Potsdam, NY), Bridget Amulike (SUNY Potsdam, Potsdam, NY), Jessica Rogers (SUNY Potsdam, Potsdam, NY), Madison Shammas (SUNY Potsdam, Potsdam, NY), and Madison Bauer (SUNY Potsdam, Potsdam, NY)

Abstract - As part of a larger study examining mammal diversity and abundance along the rural–urban interface (RUI) around Potsdam, NY, we piloted a novel method of detecting small mammals using camera traps mounted on the inside bottom of upside down plastic buckets that had openings cut in them. We first evaluated bucket color, bucket size and magnifying power of corrective lenses over the camera lens to adjust focal length by pulling study skins of mice, shrews, and a *Tamias striatus* (Eastern Chipmunk) through the camera's field of view. Our findings suggest that 7–gallon buckets provide a larger field of view and are more likely to get an image, and the +3.0 diopter lenses provide greater resolution than +2.5 lenses. Both white and black buckets work well. We field-tested bait types (including peanut butter/oats mixture, a seed mixture, and roasted peanut butter oil), bait presentation, and bucket opening size to find a bait that will attract small mammals and minimize interference by larger mammals such as skunks and *Procyon lotor* (Raccoon). Roasted peanut butter oil worked as well as peanut butter and seed mixtures in attracting mammals and could not be removed by visiting mammals, so the camera traps required less bait changes and functioned longer. We also found a bucket-trap opening that excluded mesocarnivores and *Sciurus carolinensis* (Gray Squirrel) yet allowed smaller mammals to enter.

Sat- 49

Bees in Boston and Beyond: Using Environmental DNA Techniques to Investigate Pollinator Relationships in Urban Gardens

Amanda M. Burgess (Simmons University, Boston, MA), Anna Aguilera, Ph.D. (Simmons University, Boston, MA), and Jane Lopilato (Simmons University, Boston, MA)

Abstract - *Apis mellifera* (European Honeybee) was introduced to North America from Europe in the 17th century, and among pollinators the Honeybee is considered one of the most efficient. There is an array of bee species native to Massachusetts; however, it is unclear whether introduced Honeybees are outcompeting native bees for resources across Boston, especially as urbanization increases. The aim of this research is to establish a protocol for using eDNA techniques which can be used to investigate relationships between introduced Honeybees and native bee species. This study focuses on extracting and visualizing mitochondrial DNA derived from Honeybees and a native species to establish positive control while independent validation of in-house techniques is conducted using next-generation sequencing. Application of the established protocol will include the identification of eDNA from sampled flowers in designated pollinator gardens around Boston. We will present results with regards to the analysis of the optimization of mitochondrial DNA processing in addition to the data collected from samples processed with next-generation sequencing. The establishment and validation of eDNA techniques will allow for widespread demographic studies with the ability to engage individuals without professional field training, as well as greater insight into complex pollinator interactions between native and non-native species in urban landscapes. We hope to demonstrate that innovative molecular approaches to ecological research questions can be accomplished without the use of high-throughput technology not accessible to undergraduate laboratories.

Sat- 23

Forest and Snow Rather than Food or Foe Limit the Distribution of a Generalist Mesocarnivore in Winter

Andrew R. Butler (University of New Hampshire, Durham, NH), Bryn E. Evans (University of Maine, Orono, ME), Alessio Mortelliti (University of Maine, Orono, ME), and Remington J. Moll (University of New Hampshire, Durham, NH)

Abstract - Investigating species responses to trophic interactions and abiotic factors is crucial to better understanding their ecology and creating effective management strategies. In carnivore communities, smaller species are often regulated by larger ones via top-down interference competition. Smaller subordinate carnivores can also be regulated by bottom-up and abiotic factors, such as the availability of important prey, habitat features, and climatic conditions. However, substantial ambiguity remains regarding the relative roles these complex factors play in shaping subordinate carnivore populations, especially during the winter. To investigate this issue, we conducted a large-scale, camera-trapping study (n = 197 sites distributed across a ~60,000 km^2 landscape) using a balanced study design that sampled a gradient of forest disturbance and climatic conditions. We used dynamic occupancy modeling to examine the influences of top-down (interference competition), bottom-up (prey and habitat), and abiotic (climate) factors on a widespread, generalist subordinate mesocarnivore, *Vulpes vulpes* (Red Fox), in Maine. Across 3 winters, we collected 107 Red Fox and 435 *Canis latrans* (Coyote) daily detections, and 6389 *Lepus americanus* (Snowshoe Hare) detections. We found evidence for top-down effects of Coyotes on Red Fox site-use intensity and site colonization. However, contrary to theoretical expectations, the association between Coyotes and Red Foxes was positive rather than negative. Snowshoe Hares had a positive association with local extinction by Red Foxes, which also contrasts with prevailing theory given that Snowshoe Hares are important winter prey of Red Foxes in this ecosystem. The intensity of forest disturbance and the proportion of conifer forest had negative effects on Red Fox occurrence and site-use intensity, while snow depth had a strong negative effect on site colonization. Together, these results suggest Red Foxes are limited more by abiotic and bottom-up factors related to habitat than by the top-down interference competition or primary-prey availability in winter. Our study supports recent findings that bottom-up factors may shape carnivore distributions during less-productive times of year. Our work also highlights how caution is needed when extrapolating previous results from summer studies to winter, as the role of top-down and bottom-up factors may change seasonally.

Sun- 13

Effects of Carrion Decomposition on Arthropod Community Structure Seven Years Later

Morgan Cadd (Bridgewater State University, Bridgewater, MA), M. Caitlin Fisher-Reid (Bridgewater State University, Bridgewater, MA), Christopher P. Bloch (Bridgewater State University, Bridgewater, MA), and Samantha J. Sawyer (Curry College, Milton, MA)

Abstract - Carrion decomposition is a necessary process that is enhanced by the activity of necrophagous arthropod communities in and around the carrion. These arthropods increase in abundance and diversity in the presence of carrion, but changes in community composition and structure at skeletal remains over time are not well known. This study focuses on the long-term community structure of necrophagous arthropod communities, long after soft tissue decomposition is over. In 2015, S.J. Sawyer and C.P. Bloch placed 4 *Sus scrofa domesticus* (Pig) heads in cages in the Great Hill Forest on the campus of Bridgewater State University in Bridgewater, MA. Carrion cages were at least 7 m apart. They collected the top 0.3 m of leaf litter next to and around the carrion multiple times over a 20-week interval to capture the dynamics of arthropod communities as decomposition proceeded. Seven years later, all 5 cages are still in their original locations, and 4 of them still contain the skeletal remains. We returned to these sites in September 2022 and collected leaf litter following the same protocol from the 4 skulls, from within the empty cage, and from 3 other control sites nearby, which have similar canopy cover, foliage, and ground cover. We sampled all sites 3 times at haphazard points around each site. We extracted arthropods from the leaf-litter collections with Berlese funnels, preserved all specimens in 70% ethanol, and are currently identifying them to family level of taxonomic resolution. We will present preliminary findings on family richness and abundance at skull vs. control sites in 2022. Once all identifications are complete, we plan to compare the overall diversity of the current samples to the 2015 samples to determine if there are any long-term patterns in arthropod activity at carrion sites compared to nearby non-carrion sites.

Sun- 38

Body Size and Trophic Efficiency Influence Species Richness of Solitary Hymenoptera Clades Along New England Elevational Gradients

Ben Camber (University of Vermont, Burlington, VT)

Abstract - Communities change along elevational gradients due to local abiotic and biotic changes, but in diverse taxa, differences in evolutionary history and species pools between clades make it difficult to predict the overall diversity–elevation relationship. Solitary Hymenoptera include 14 superfamilies in New England which vary in morphology and life-history strategy. Despite all we know of their incredible diversity and ecological importance, solitary Hymenoptera are largely exceptions to our understanding of the species–energy relationship. The "more individuals" hypothesis of species–energy theory, which states that energy availability limits population sizes, suggests body size and trophic efficiency, or the number of hosts required to produce an offspring, may drive Hymenoptera clades' different alpha diversity patterns over elevational gradients. Parasitoid wasps have arguably the greatest trophic efficiency of all carnivorous animals, and some parasitoid groups (Ceraphronoidea, Platygastroidea, Chalcidoidea) are among the smallest known insects. To quantify how these traits drive richness–elevation relationships among Hymenoptera clades, I tested their correlations with the slopes of linear models and the concavity coefficients of quadratic models based on sampling of solitary Hymenoptera using Moericke yellow pan traps and hand-netting at low elevations and along 2 replicate elevational gradients (500–1200 m a.s.l.) on Mount Mansfield and Camel's Hump Mountain in Vermont. More than 2400 solitary Hymenoptera were collected, representing each New England superfamily except Stephanoidea, Mymarommatoidea, and Trigonaloidea. Wasps with the lowest trophic efficiency (predacious wasps) declined precipitously with elevation. Species richness of parasitoid clades Braconidae and Platygastroidea declined moderately with elevation, while Ceraphronoidea, Cynipoidea, and Ichneumonidae had hump-shaped distributions. Chalcidoidea increased in diversity with elevation. The slopes of linear models of each clades' richness–elevation relationships exhibited a weak positive correlation with trophic efficiency ($R^2 = 0.159$). However, contrary to prediction, quadratic models showed revealed a negligibly weak increase in convexity (U-shape) with trophic efficiency ($R^2 = 0.0381$). Increasing body size was correlated with a more negative slope of linear model ($R^2 = 0.563$) and insignificantly correlated with coefficients of quadratic model square terms ($R^2 = 0.0159$). These results support the hypothesis that parasitoid lifestyle and small body size are drivers of anomalous diversity patterns on mountains, and potentially latitude as well.

Sun- 43

Effects of Weather on Migratory Foliage-Roosting Bat Activity in the Adirondacks

Alexa R. Carlson (SUNY College of Enviromental Science and Forestry [ESF], Syracuse, NY), Julia R. Rizzo (SUNY ESF, Newcomb, NY), Stacy A. McNulty (SUNY ESF, Newcomb, NY), and Vanessa G. Rojas (SUNY ESF, Wanakena, NY)

Abstract - Climate change is affecting bat species' ranges and ability to forage. Despite bats' ecological importance and major population declines, little research has been conducted in the Adirondack Park, with almost no research focused on foliage-roosting bats. The foliage-roosting bats found in New York State and the focus of this study are *Lasiurus borealis* (Eastern Red Bat), *Lasionycteris noctivagans* (Silver-haired Bat), and *Lasiurus cinereus* (Hoary Bat). In this study, we tested if the activity of these 3 bat species was affected by 4 weather covariates: wind, precipitation, temperature, and humidity. We rotated 5 ultrasonic acoustic detectors among 16 sites from 31 May to 10 September, with at least 14 detector nights per year at each site. These sites resided in a 100-ha managed forest area of the SUNY ESF Huntington Wildlife Forest in Newcomb, NY. After identifying the species, acoustic data was paired with weather data from the summer field season. We separated the data by year to analyze the difference in bat activity between 2021 and 2022, with average summer precipitation of 2.49 mm and 1.87 mm, respectively, during an acousitic night (19:00–6:00). We analyzed the data using a logistic regression, calculating a probability of presence and logistic fit for the model. Preliminary data suggest that Silver-haired bat and Hoary Bat presence decreases during periods of higher precipitation and lower temperatures. Eastern Red Bat presence is relatively unaffected by these weather conditions. Although this study focused on only 2 years of weather data, climate change will make varying weather conditions from year to year more common. As such, it is important to understand how these species respond. Future studies should further assess how weather affects bat foraging activity, and quantify the resilience of different bat species to changing weather conditions.

Sat- 47

The Hudson Valley Firefly Project: Anthropogenic Disturbances Reduce Population Abundance

Juliana Chauca (Ossining High School, Ossining, NY)

Abstract - There is limited information on the abundance status of *Lampyridae* (Fireflies) in the Hudson Valley region, making it difficult to determine how they are affected in an area near a large urban center, New York City. Artificial light at night (ALAN) can inhibit firefly mating behaviors, as they use their bioluminescent flashes to attract mates. Therefore, my study investigated how fireflies are impacted by ALAN and other anthropogenic disturbances using a community science approach. I recruited 73 participants from a local public school district and nature centers. Individuals filled out observational forms on ArcGIS Survey123 during June and July regarding firefly abundance and behavior, as well as the location and presence of anthropogenic disturbances on the property. On average, 40 firefly flashes were detected per minute. Firefly abundance was not significantly reduced by outdoor lighting ($P > 0.05$). However, the use of irrigation practices significantly lowered mean firefly abundance counts ($P < 0.001$), and differences in means between properties that contained fungicides and those that did not was approaching significance ($P = 0.0516$). These findings may contribute to firefly abundance assessments in the northeast region of the US, indicate how fireflies are being impacted in the area, and spread awareness on firefly conservation.

Sat- 16

---

qPCR Surveillance of Tick-Borne Disease in Delaware

Alexander W. Collins (Delaware Technical Community College, Stanton, DE), Michael Buoni (Delaware Technical Community College, Georgetown, DE), and John McDowell (Delaware Technical Community College, Stanton, DE)

Abstract - Tick-borne diseases are increasing in prevalence in the eastern United States. While the best-known tick-borne disease in the region is Lyme disease, caused by the bacterium *Borrelia burgdoferi*, a variety of tick-borne bacteria, viruses and protozoans are of increasing epidemiological interest. Quantitative polymerase chain reaction (qPCR) provides a convenient means of detecting multiple pathogens simultaneously.We collected ticks in New Castle County, DE, and barcoded them to confirm identification. We then screened the specimens for *Borrelia burgdoferi*, *Anaplasma phagocytophilum, Babesia microti, Ehrlichia chafeensis*, and *Ehrlichia ewingii* through qPCR to better understand their prevalence and distribution among tick species.

Sat- 21

Parasite Communities in Canada Geese (*Branta canadensis*)

Felicia M. Conheady (SUNY Purchase, Purchase, NY), Suhani Kuman (SUNY Purchase, Purchase, NY), Amelia Whitehurst (SUNY Purchase, Purchase, NY), and Erika T. Ebbs (SUNY Purchase, Purchase, NY)

Abstract - Anthropogenic changes, such as habitat loss and pollution, have affected many species including the way certain species are distributed around the globe. One example of this is *Branta canadensis* (Canada Goose), and the helminth parasite communities they host. Although the Canada Goose is a well-studied species, the communities of helminth parasites hosted by Canada Geese are less well understood. As many helminth species are the cause of disease in both humans and wildlife, it is crucial to understand the distribution and species diversity found within the host. Furthermore, the fact that waterfowl such as Canada Geese travel such long distances and occupy a variety of habitats, may add to the diversity of their parasite community. To better understand parasite communities associated with Canada Geese, we conducted necropsies of hosts collected from Michigan (Mississippi Flyway) and New York State (Atlantic Flyway). We specifically examined the liver, nasal passages, gastrointestinal tract, and heart from individual geese, and examined the contents for helminth parasites using a stereomicroscope. After performing gross identification of the helminths, we used traditional morphological techniques to make permanent mounts of the specimens to improve our identifications of recovered taxa. It was found that 61.5% of the geese studied were infected with 1 or more helminth species. We also included data from published helminth surveys of Canada Geese to add to our dataset. We found that Canada Geese had higher amounts of tapeworms (Cestoda) than any other helminth group, specifically in the gastrointestinal tract. In addition, several trematode (Trematoda) species were also recovered, including an undescribed schistosome species (Schistosomatidae). The observation of schistosome is significant as they have been shown to cause zoonotic diseases in humans, making it crucial to understand which species are associated with and can be transmitted by Canada Geese.

Sat- 31

Overwintering Survival of Color-banded House Sparrows in Westchester, NY

Jennie Consalvo (Purchase College, SUNY, Purchase, NY) and Allyson Jackson (Purchase College, SUNY, Purchase, NY)

Abstract - *Passer domesticus* (House Sparrow) is a common invasive bird species originating from Europe and Asia. It was introduced to the United States around 200 years ago when the Europeans began their colonization of the Western world by taking rides on the ships or even sometimes being intentionally introduced into the new world. Despite being ubiquitous, there is relatively little published data on the site fidelity and overwinter survival of House Sparrows in the Northeast. House Sparrows are not thought to venture far from their established territories and only tend to be territorial of their immediate area during breeding season, otherwise forming large flocks. We were interested in studying the overwinter (October–February) survival and site fidelity of House Sparrows on the Purchase College campus (Westchester, NY). We set up a banding station at 2 points in the overwintering period (21–22 October 2022 and 8–9 February 2023) near a bird feeding station on campus, where House Sparrows were often observed. During this time, a total of 73 birds were banded, with a total of 12 different species captured. Of those captured, we measured and uniquely color-banded 24 House Sparrows in October 2022, and another 8 in February 2023. From October 2022 to February 2023, we spent a total amount of 25 hours resighting the House Sparrows and making note of which sparrows were still in the area in order to observe their behaviors during the wintertime. With a total of 32 House Sparrows uniquely color-banded, we can give an estimate of survival and site fidelity.

Sat- 24

Tree-mendous Trouble: Influence of Tree Encroachment on Evapotranspiration in a Boreal Peatland at its Southern Range Limit

Shannon Cooper (SUNY Plattsburgh, Plattsburgh, NY), Steve Langdon (Shingle Shanty Preserve and Research Station), and Mark Lesser (SUNY Plattsburgh, Plattsburgh, NY)

Abstract - Boreal peatlands are increasingly threatened by ongoing climate change, particularly at their southern range margins. Increases in evapotranspiration (ET) rates due to rising temperatures result in drier, more favorable substrate for tree species that facilitate encroachment and reduce water storage. Tree encroachment in turn can have significant impacts on ET that furthers the shift towards a forested peatland and away from an open-bog system. Tracking changes in ET, temperature, and tree species abundance and composition within a boreal peatland at its southern range margin is important for understanding biological changes that come with climate change. We are studying this at the Shingle Shanty boreal peatland complex in the western Adirondacks. Species such as *Picea mariana* (Black Spruce) and *Larix laricina* (Eastern Larch) are common, along with broadleaf species such as *Acer rubrum* (Red Maple) and *Betula* spp. (birches). In this study, we recorded daily temperature and ET values at 6 plot locations within the peatland, 3 of which were located in an open bog and 3 located in a forested bog. We installed water-table loggers at each plot center and recorded tree species, basal area, and density in plots of 5-, 10-, and 15-m radii around each water logger. For the 5-m plots, tree abundance and basal area were 55 and 0.27 m² in forested plots and 16 and 0.009 m² in open-bog plots, respectively. Average richness was 4 species in forested plots and 1 in open bog plots and increased to 5 and 2, respectively, in 15-m plots. Of potentially further importance, 5 of the species occurring in forested plots were broadleaf species, while all species in open-bog plots were conifers. We will model ET against forest structure and temperature to determine the relationship between ET, forest structure, and species composition at different spatial scales. Ultimately, climate change and tree encroachment have the ability to change ecosystem functions of a boreal peatland and can have lasting effects on wetland plant and animal communities. Understanding how tree encroachment alters ecosystem function (i.e., ET) is important for long-term maintenance and protection of these ecologically significant complexes.

Sun- 31

Seasonal Dynamics of Coexisting *Nicrophorus* Species Prior to American Burying Beetle Reintroduction

Autumn Cornacchia (SUNY Cobleskill, Cobleskill, NY) and Carmen Greenwood (SUNY Cobleskill, Cobleskill, NY)

Abstract - The federally endangered *Nicrophorus americanus* (American Burying Beetle) was once found in 36 states across the United States. Due to unknown causes, this beetle drastically declined over the last century, leading to their federal listing as endangered in 1989. This species is dependent on carrion as both food and, more importantly, a reproductive resource. *Nicrophorus* species avoid competition with other competitors, like vertebrate scavengers and insects, by burying their reproductive carrion underground. They also appear to be actively seeking reproductive resources at different times of the year, as a form of temporal resource partitioning. To determine if they were exhibiting temporal resource partitioning, we sampled burying beetles from May to August 2022 at Greenwoods Conservancy. A total of 2786 beetles were captured between 6 species throughout the experiment using aboveground pitfall traps. We used a total of 12 traps, within 4 habitats (3 traps in each), checking traps daily. We found that there was very little overlap in the peak activity times of the *Nicrophorus* spp., suggesting that they were able to successfully coexist, even when using the same limiting resource for survival. This information will help us to evaluate impacts on reproductive-resource partitioning once the American Burying Beetle is reintroduced to New York State.

Sat- 18

Blacklegged Tick Infection Dynamics in Northern Vermont Forests

Samuel F. Cranston (University of Vermont, Burlington, VT) and Ellen Martinsen (University of Vermont, Burlington, VT)

Abstract - Infectious diseases transmitted by *Ixodes scapularis* (Blacklegged Tick or Deer Tick) pose a significant public health concern to humans, domestic animals, and wildlife. In recent years, populations of Blacklegged Ticks and their pathogens have expanded in range and increased in prevalence in the United States. In this study, we collected 238 nymphal Blacklegged Ticks at 5 sites across a forest-fragmentation gradient in northern Vermont. Using multiplex PCR, we screened the ticks for 3 important zoonotic pathogens: *Borrelia burgdorferi, Anaplasma phagocytophilum*, and *Babesia microti.* We found infection with all 3 pathogens in our collected ticks. We expect to find a positive correlation between forest-fragmentation levels and pathogen prevalence within tick samples, including coinfections. We also expect to find a positive association between *Borrelia burgdorferi* and *Anaplasma phagocytophilum* infections within coinfected tick samples. This study aims to provide a better understanding of how land-use changes impact the prevalence of tick-borne pathogens. It also aims to illuminate potential non-random associations of the 3 pathogens of interest within the Blacklegged Tick host.

Sun- 37

More Than Meets the Eye: Binocular Vision in Wasps

Elijah Crosbourne (SUNY Plattsburgh, Plattburgh, NY)

Abstract - Binocular vision is the overlap of the visual fields of both eyes. Although it has received considerable attention from the scientific community due to being a large component of human vision, its purpose is still poorly understood. Many theories about the function of binocular vision have been proposed, but one of the most popular ideas is that binocular vision increases depth perception. Despite the popularity of this idea, actual evidence that conclusively supports this hypothesis is scarce. And while binocular vision in humans has been thoroughly studied, very little research into binocular vision in animals has been conducted, especially in insects. One of the most prominent features of binocular vision is actually a blind spot between the 2 eyes; studies in birds suggest that the primary benefit of binocular vision is reducing the anterior blind spot enough for birds to be able to see the tips of their beaks. Many insects, like hymenopterans (bees, wasps, etc.) have a similar degree of binocular overlap as well as excellent vision, allowing them to navigate through the air, pollinate flowers and hunt prey. We hypothesize that like birds, binocular vision in wasps reduces the anterior blind spot, allowing them to perform complex visual tasks, especially grasping prey. Many species of wasps hunt by latching onto prey with their front legs before curling their bodies and stinging them; since this method of hunting only involves stinging after the prey, which is normally larger than the wasps themselve, is already captured, it implies that stinging would be less visually demanding than the initial prey capture. If latching onto prey with their front 2 legs before stinging is their primary method of hunting, then the shape of the anterior blind gap—and thus of the binocular visual field—should correspond to the tips of the 2 front legs, similarly to how birds' binocular visual field correspond to the tips of their beaks.

Sun- 45

Avian Use of Porcelain Berry at Purchase College, SUNY Campus

Skylar C. Cullen (SUNY Purchase, Purchase NY) and Allyson K. Jackson (SUNY Purchase, Purchase NY)

Abstract - In an increasingly anthropogenic world, local wildlife species are constantly facing new environmental changes and challenges, one of them being the introduction of multiple new food sources, which may or may not involve the reduction of native ones. In the Northeast, a common invasive species is *Ampelopsis brevipedunculata* (Porcelain Berry). This invasive is dominant at the Purchase College, SUNY campus in Westchester, NY. We were interested in how bird species on campus use Porcelain Berry during the fall season. Over a period of 8 weeks, we observed 3 sites containing Porcelain Berry at high, low, and median heights for bird usage and activity ($n = 24$). Upon seeing birds present in sites with dense Porcelain Berry cover, we captured birds in order to obtain fecal samples for stable isotope analysis. From Oct 21 to 22, we collected fecal matter from 14 birds overall, consisting of the following species: *Passer domesticus* (House Sparrow), *Cardinalis cardinalis* (Northern Cardinal), *Melospiza melodia* (Song Sparrow), *Haemorhous mexicanus* (House Finch), *Baeolophus bicolor* (Tufted Titmouse), *Setophaga coronata* (Myrtle Warbler), and *Zonotrichia albicollis* (White-Throated Sparrow). We also tested Porcelain Berries from each low, median, and high site (3 sets), along with 4 general species of insects (beetles, stinkbugs, crickets, spiders), and 3 of the main ingredients in the bird seed used on campus (corn, sunflower seed, millet for carbon-13 and nitrogen-15 to be able to reconstruct the food web of what the birds were eating. Proof that birds are eating these berries could lead to further research about their health benefits and the health benefits of other non-native plant species that local wildlife may be feeding on.

Sat- 29

Examining Color Preference of Painted Lady Butterflies on the Ultraviolet (UV) Light Spectrum

Caitlyn R. DiAngelis (University of Saint Joseph, West Hartford, CT)

Abstract - During Fall 2021, I observed a large presence of insects such as crickets, bees, and flies within the pollinator garden at the University of Saint Joseph. However, there were no butterflies seen interacting with the pollinator garden at the times of observation. This data is of critical concern since butterflies have various important roles in maintaining a healthy ecosystem. In fact, it is estimated that pollination is essential in the reproduction of ~90% of plants. To combat the lack of butterfly presence seen within the pollinator garden, I am conducting laboratory observations to examine potential color preference amongst *Vanessa cardui* (Painted Lady Butterfly), a butterfly species native to Connecticut. The aim of this study is to collect data that will aid in attracting more butterflies to the University of Saint Joseph so that a healthy ecosystem can continue to be maintained on campus. I am testing the color preference of *Vanessa cardui* using foam circles in a plethora of colors that mimic the shape of flowers seen within their natural habitat. The control colors used within this experiment are dark blue and green. Expanding upon research I conducted in Fall 2022, I am testing 2 colors against the controls at the same time during each observation. The predicted results of this study include the preference of purple and pink colors due to their prevalence amongst attractive plants. Based on collected data, plants of preferred colors will be added to the pollinator garden on campus.

Sat- 17

Through a Pollinator's Eye: Using Ultraviolet-Induced Visible Fluorescence (UVIVF) Photography to Capture How Flowers Look on the UV Spectrum

Caitlyn R. DiAngelis (University of Saint Joseph, West Hartford, CT)

Abstract - The ultraviolet (UV) portion of the electromagnetic spectrum is invisible to humans. However, many insects, such as butterflies and bees, can detect colors on the UV light spectrum. This is done using photoreceptors within their eyes that can detect the higher frequencies of UV light. Colors on the UV light spectrum can be photographed using a technique known as ultraviolet-induced visible fluorescence (UVIVF). The process of UVIVF is conducted through the projection of pure UV light onto the object being photographed. White light can be used to detect the positioning of the UV light, but the space should be completely dark when the pictures are taken. The object absorbs the UV light and releases it at longer wavelengths found on the visible light portion of the spectrum, which enables the camera to photograph the fluorescent light. The camera does not need to have any special modifications in order to take photographs using UVIVF. To explore the concept of UVIVF further, I am conducting a project using UVIVF photography at the University of Saint Joseph. I plan to partake in this process using 2 photography methods. The first involves the use of a digital single-lens reflex (DSLR) camera that can autofocus on the flowers of choice and can store many photos. In addition to using the DSLR camera to take the photos, I will use 4 Adaptalux UV light arms to position the UV light onto the flowers in a dark room for each photo. For the second method of photography, I will use a cell phone rather than a DSLR camera. In order to successfully capture the fluorescent light in the photo, the flowers will be photographed within a UV viewing cabinet. Numerous studies have demonstrated that pollinators see on the UV light spectrum. The aim of this project is to gain a better understanding of how pollinators view flower coloration. Ultimately, I am using the UVIVF photography technique to see how objects/colors appear visually under different light wavelengths.

Sun- 48

A Little Bird Told Me … : Habitat Use by Avian Species Following Wildfire in a Disturbed Jack Pine Barrens

Caley Doell (SUNY Plattsburgh, Plattsburgh, NY), Luke Tyrrell (SUNY Plattsburgh, Plattsburgh, NY), and Mark R. Lesser (SUNY Plattsburgh, Plattsburgh, NY)

Abstract - Birds are an important part of all ecosystems; they are found on every continent across a wide range of habitats. The health of bird populations in an area is a crucial indicator of the health of that ecosystem because they are responsive to habitat changes, such as food and breeding-area availability. Differences in forest structure (e.g., foliage diversity, canopy height, understory cover, coarse woody debris, and snags) can play a large role in dictating specific habitat requirements and utilization for many bird species. The objective of this study was to understand how bird communities are using different-aged forest patches within a pine barrens system and surrounding northern hardwood forest. The Altona Flat Rock, in northeastern New York, is a globally rare ecosystem dominated by fire-dependent *Pinus banksiana* (Jack Pine). Over the past century, multiple wildfires have burned various areas and extents of the Flat Rock creating a mosaic of stand ages intermixed with swaths of unburned northern hardwood forest and wetlands. In fall 2022, we surveyed bird communities across 2 different-aged Jack Pine stands that had originated following wildfires in 1957 and 2018. We also surveyed the surrounding mixed-hardwood forest. We conducted distance-weighted point sampling using both visual and auditory methods. Within each forest stand, we randomly selected 8 sampling locations and visited them twice over the course of 1 month. We recorded 18 different species across the 3 stands, with 8, 12, and 9 species occurring in the 1957 origin, 2018 origin, and hardwood stand, respectively. Some of the most commonly observed species that were observed across all 3 stands were *Poecile atricapillus* (Black-Capped Chickadee), *Junco hyemalis* (Dark-Eyed Junco), and *Cyanocitta cristata* (Blue Jay). Diversity varied from 4.70 in the 1957 origin stand to 7.53 in the 2018 origin stand. The average similarity between all sites was ~0.2. These preliminary differences in richness and diversity coupled with the low similarity indicate habitat differentiation. Continued and more intensive sampling in the spring of 2023 will further elucidate any trends and allow us to compare our data to historical surveys from 1978 and 1994.

Sun- 11

Exploring the Genetic Diversity of Oleander Aphids (*Aphis nerii*)

Shawn Driscoll-Gomez (Bridgewater State University, Bridgewater MA), M. Caitlin Fisher-Reid (Bridgewater State University, Bridgewater, MA), and Heather Marella (Bridgewater State University, Bridgewater, MA)

Abstract - *Aphis nerii* **(**Oleander Aphid) is a non-native ectoparasite that feeds on North American *Asclepias* spp. (milkweeds). Aphids feed on the sugars from the phloem of the host plant to grow and develop. Oleander Aphids are obligately asexual, with no known sexual stage. There is genetic evidence that the North American populations belong to a single, genetically similar "super clone". In this study, we are exploring the genetic variation of Oleander Aphids that reach southeastern Massachusetts, compared to more western and southern populations. Aphids were collected from Massachusetts, New York, Pennsylvania, and Wisconsin in late summer or early fall of 2022 and stored in ethanol. In total, we have 66 samples, each containing several aphids collected from a single plant from a wild population. We extracted DNA from 1 large aphid from each population sample and are using PCR to test for amplification success of several mitochondrial genes and nuclear microsatellite primer sets. We will then use successful primer sets to collect sequences for phylogeography and population genetic analyses. We anticipate that populations located closer together are be more genetically similar than the populations with greater geographic distance between them.

Sun- 35

Comparing Benefits and Drawbacks of Ammonia Degreasing vs Hot Water Degreasing of Variably Sized Skulls in Museum Collections

Lily Duerr (University of Vermont, Burlington, VT), Sara Helms Cahan (University of Vermont, Burlington, VT), and Charles Kilpatrick (Professor Emeritus, University of Vermont, Burlington, VT)

Abstract - In many museum collections, animal skulls and skeletons are degreased using ammonia, a technique that is fast and relatively effective. However, ammonia degreasing (AD) requires a hood or other well-ventilated area as well as personal protective equipment and often leaves processed bones in sub-par condition. We propose an alternate method of degreasing which is more cost-effective, does not require a hood, operates on similar timelines to ammonia degreasing and does not degrade the condition of material processed in this way. Hot-water degreasing (HWD) refers to the method by which a solution of degreasing dish soap and water is heated by some mechanism in which greasy skull and skeleton material is submerged and allowed to degrease for several weeks. To determine which method is more viable for the University of Vermont's Vertebrate Teaching Collection, we experimentally compared the benefits and drawbacks of HWD and AD using percent change in mass as our primary metric, supported by visual change. Across a variety of skull sizes (30–1000 g), we found that AD produces a larger decrease in mass but also suffers from much more variable outcomes than HWD per skull processed. In removing the smallest skulls from the dataset (<100 g), HWD produces a significantly larger decrease in mass than AD. In this presentation, we will discuss the situationally specific drawbacks and benefits of each method, including finances, time restraints and space allocation as they apply to variable museum collections.

Sun- 21

Do Larger Diameter Trees Allow for More Microhabitats and Impact Bird Abundance in Managed Forests?

Monica Edgerton (SUNY ESF, Syracuse, NY), Gregory McGee (SUNY ESF, Syracuse, NY), and Stacy McNulty (SUNY ESF, Newcomb, NY)

Abstract - Sustained production of forest products and maintenance of wildlife habitat remain top priorities, and challenges, for forest managers. Commonly applied cutting guides for northern hardwood forests suggest harvest of trees by 40–45 cm diameter (dbh). However, trees >50 cm dbh offer a wider variety of wildlife microhabitats for birds and insects. Therefore, it is possible that the abundance of these tree-related microhabitat (TreMs) may be diminished in some managed forest systems if trees are regularly removed before the habitat features can develop with size and age. The lack of TreMs may be consequential for bird abundance and diversity. This study contrasts the effects of large tree retention and canopy openness on bird abundance and community composition. We hypothesize that (1) shelterwood sites with residual trees ≥50 cm dbh have more TreMs per hectare than shelterwood sites with trees ≤49 cm dbh and (2) shelterwood sites with residual trees ≥50 cm dbh have a greater abundance and diversity of birds per hectare than shelterwood sites with trees ≤49 cm dbh. For this study, we used four ~28-ha Adirondack northern hardwood forest sites: commercial shelterwood (residual tree diameter ≤49 cm dbh, open canopy), experimental shelterwood (no size limit on residual stems, open canopy), selective cut (residual trees ≤49 cm dbh, closed canopy), and old growth (no size limit on trees, closed canopy). We conducted 9 repeat-visit point counts in each site at 200-m intervals to measure bird abundance and to acquire forest structural and TreM data on an associated nested-plot cluster. By sight inspection from the ground, we counted and characterized the TreMs that are most closely correlated to bird abundance in the literature: number of cavities and large rot holes, and presence of a broken crown, crown deadwood, and exudates. We will analyze the data using repeat-visit models and an MRPP to determine the impact of tree diameter, canopy cover, and TreMs on bird abundance and community composition.

Sat- 26

Investigating Historical Extirpations and Range Shifts of *Acris* spp.

Elise M. Edwards (Cornell University, Ithaca, NY), Riley Mummah (University of Massachusetts Amherst, Amherst, MA), Brittany Mosher (University of Vermont, Burlington, VT), and Patrick Sullivan (Cornell University, Ithaca, NY)

Abstract - Integrated species distribution models (SDMs) using site-occupancy and presence-background data are a relatively new advancement in ecology and statistics. Using presence-background and site-occupancy data to provide predictions of species abundance throughout time can provide a better look as to how historical data can inform current management decisions. We are currently using integrated SDMs to examine extirpation and range shifts for *Acris* spp. (cricket frogs). Cricket frogs have been experiencing drastic declines at the northern extent of their range for the last 30–40 years, and it is important to investigate the historical patterns of these declines to inform current management. As such, we have collected and integrated over 80 different datasets from surveys of cricket frogs. This dataset represents the most cohesive *Acris* dataset known to exist. However, challenges arise with historical and combined datasets due to non-standardized sampling across time and space. Using presence-only, absence-only, and more robust presence–absence (detection/non-detection) surveys across multiple datasets, we can help address some of these challenges. Additionally, by accounting for imperfect detection as well as the data source within these different datasets, we can better examine historical patterns in range shifts across large scales. We use integrated SDMs to evaluate the probability of extirpation of cricket frogs at a broad scale and assess how different environmental covariates play a possible role in these extirpations and ranges shifts present in our historical dataset.

Sat- 40

Goat Grazing Followed by Repeated Cutting of *Reynoutria japonica*, s.l., (Japanese Knotweed) Allows Recovery of Diverse Flora

Richard S. Feldman (Marist College, Poughkeepsie, NY), Radka Wildova (Marist College, Poughkeepsie, NY), Erik Anderson (Marist College, Poughkeepsie, NY), and Casey Yamamoto (Marist College, Poughkeepsie, NY)

Abstract - *Reynoutria japonica*, s.l., (Japanese Knotweed) was controlled via goat grazing and then repeated cutting on 0.53 ha for 6 years prior to measuring vegetation recovery. What plant species would colonize after suppression of the prior Knotweed monoculture? How would species distributions relate to each other and to soil conditions? After treatment, Japanese Knotweed was still common, but its biomass declined dramatically across the site, allowing 47 other plant species to colonize. We recorded species identity and cover, and soil texture, depth, and available water capacity along a 95-m transect. Both native species (31) and non-native species other than Japanese Knotweed (16) colonized the treated area. Japanese Knotweed cover was positively correlated with percent clay and available water capacity and negatively correlated with soil depth, indicating that success of knotweed control depends on environmental conditions. We used multivariate analysis (DCA) to explore distribution of newly established species across environmental gradients. Percent bare soil in sampling quadrats and percent clay were significantly ($P < 0.05$) correlated with species distribution. Species assemblages reflected differences in soil texture and soil moisture, with a pattern of non-native species occupying areas of shallow soil, in contrast to native species that were more prevalent in deeper soil. We plan reintroduction of more native herbaceous and woody perennials to further diversify the area and compete with Japanese Knotweed, using soil features and sun exposure to guide these efforts.

Sat- 11

Identifying the Molecular Basis of Thermal Adaptation in Natural Invertebrate Populations

Kylie Finnegan (University of Vermont, Burlington, VT) and Brent Lockwood (University of Vermont, Burlington, VT)

Abstract - Local adaptation results in geographically distinct populations belonging to the same species phenotypically diverging over relatively short time spans. As geographic areas are differentially impacted by climate change, the cosmopolitan *Drosophila melanogaster* (Fruit Fly), alongside other ectothermic species, is facing newly stressful environmental temperatures requiring a rapid adaptive response. In the past few hundred years, *D. melanogaster* has colonized a wide geographic range in the Western Hemisphere, with populations displaying patterns of local adaptation to a variety of climates varying from temperate to tropical. A result of this local adaptation is a difference in thermal tolerance in early embryos, the most stress-sensitive stage of the species. Thermal tolerance is generally seen to be a result of either increased basal production of protective elements, or the ability to rapidly initiate a strong stress response, but the complexity of adaptation in quantitative traits has prevented a clear understanding of the genetic and physiological mechanisms allowing thermal adaptation. In this study, we capitalize on the unique phylogeography of this species and the use of lab-directed evolution to identify single nucleotide polymorphisms (SNPs) and differentially expressed genes (DEGs) between thermally sensitive and thermally tolerant genotypes. We aim to determine the importance of phenotypic plasticity on thermal stress sensitivity by conducting DNA and RNA sequencing and comparing relative effects of the observed genomic and transcriptomic variation. Functional enrichment analysis of differentially expressed genes identifies several gene ontology functional categories, including oxidative stress response, small molecule metabolism, and cell organization gene expression. We identify genetic polymorphisms that are enriched and correlate significance to those DEGs in thermally tolerant individuals to directly connect genotype and molecular physiology to the phenotype of embryonic thermal tolerance.

Sun- 33

Effects of Sulfur in Brimstone Creek

Shamar Fitzpatrick (SUNY Cobleskill, Cobleskill, NY)

Abstract - Stream habitats may be subject to several types of pollutants. One pollutant is hydrogen sulfur (H_2S) in Brimstone Creek in Sharon Springs, NY. Sulfur can affect water quality and organisms. However, some of these organisms adapt to live in the sulfur environment. I undertook this study to see if the concentration of H_2S and other water quality parameters (temperature, pH, dissolved oxygen) will decrease or improve as I go downstream. Also, to see if the diversity of macroinvertebrates is affected by the H_2S. I measured water-quality parameters, including H_2S, and subsampled 100 macroinvertebrates from 3 sites. I analyzed the water-quality parameters by making a graph to compare if H_2S affects the other water-quality parameters. I also calculated evenness, Shannon's diversity index, Simpson's diversity index, and Hilsenhoff's biotic index (HBI), and categorized the macroinvertebrates into functional feeding groups. There was some variation in H_2S, temperature, and dissolved oxygen in Brimstone Creek. H_2S decreased, the temperature increased, and dissolved oxygen fluctuated going downstream. The pH varied from 6.0 to 6.8, indicating the streamwater was probably well buffered. The HBI went up from 3.4 to 4.61 going downstream, showing that the invertebrates may have a tolerance for some minor pollution that might be present downstream. The Shannon's index decreased going downstream, indicating the diversity of species got less. The Simpson's index showed that abundance fluctuated in each species throughout the sites. The evenness of diversity decreased as well further downstream. H_2S dissipates quickly and does not affect the other water-quality parameters. In my study, the H_2S never exceeded 0.7 ppm (not very high), so it did not majorly affect the water quality. H_2S did not appear to affect macroinvertebrates either. However, diversity decreased as I went downstream, as did the H_2S levels, so there must be another cause. Further research should be done to see what affects the macroinvertebrate population and downstream water quality.

Sat- 36

Effects of Effluent from Bolton Wastewater Treatment on Aquatic Macroinvertebrates in Stewart Brook

Ian Gaddy (SUNY Cobleskill, Cobleskill, NY)

Abstract - The proximity of the Bolton Landing Wastewater Treatment Plant poses a possible nutrient-pollution issue for Stewart Brook in the Adirondacks region of New York. Effluent being treated at the Bolton wastewater treatment plant could potentially leach into groundwater and contaminate water downstream. To evaluate these effects, I sampled aquatic macroinvertebrates above and below the Bolton wastewater treatment plant. I used water-quality data from 3 loggers located at different increments along Stewart Brook to see nutrient pollution impacts on aquatic invertebrate community composition. I compared aquatic macroinvertebrate communities' composition to the presence of nutrient pollution in three reaches of Stewart Brook. Findings showed trends of increased nutrients below Stewart Brook in the form of soluble reactive phosphorus, total nitrogen, specific conductivity, and total dissolved solids. Downstream of Bolton wastewater treatment plant, I observed a decrease in macroinvertebrate Family richness (17 upstream, 15 downstream), Shannon's diversity index (2.60 upstream, 1.55 downstream), evenness (0.92 upstream, 0.57 downstream), and Hilsenhoff biological index. The increase in nutrient pollution was observed during summer months when Bolton wastewater treatment plant experienced its largest volumes of waste. Steps are being taken by the Town of Bolton to mitigate nutrient pollution leaching from the Bolton wastewater treatment plant. Work is being carried out to construct bioreactors that provide environments for beneficial bacteria below the treatment beds to better process nitrogen in the wastewater effluent entering the environment.

Sun- 27

The Effects of Land Cover on Mesocarnivore Distribution in a Suburban Landscape

Madelyn Aryanna Garcia (Pace University, Pleasantville, NY) and Mike Rubbo (Pace University, Pleasantville, NY)

Abstract - In Northeastern America, humans have dramatically altered landscape composition through urban and suburban development. This landscape conversion has presented distinct challenges for wildlife such as increased mortality via roads, intensified competition for resources, and human–wildlife conflicts. As wildlife populations appear to be increasing in suburban areas, there has been an increase in the numbers of reports of nuisance wildlife to regulatory agencies. Moreover, communities are resorting to management to address this growth in human–wildlife conflicts. To better understand the factors that influence wildlife populations in suburban areas, we conducted a study of mesocarnivore distributions in Ridgefield, CT, a largely suburban community. We placed 42 camera traps throughout the town from February to April 2022, with the cameras functioning at each site for 3 weeks. Mesocarnivore species identified included *Lynx rufus* (Bobcat), *Vulpes vulpes* (Red Fox), *Urocyon cinereoargenteus* (Gray Fox), and *Canis latrans* (Coyote). *Ursus amercianus* (Black Bear) was also detected. These data indicate that Red Fox and Coyote appeared to occupy different areas while Bobcat were uniformly distributed throughout town. We are currently investigating the influence of land cover on these species. Regardless, it does appear that these species have adapted to suburbanized landscapes, and that specific strategies will be required to minimize potential future human–wildlife conflicts.

Sat- 51

Bee-utiful Sight: Sociality and Visual Fields in Hymenopterans

Katherine Gennosa (SUNY Plattsburgh, Plattsburgh, NY)

Abstract - Collective vigilance, a coordinated foraging strategy used by groups of animals to detect predators, could be connected to differences in visual fields between social and solitary species. Social foragers may use collective vigilance to coordinate their vigilance behavior, therefore allowing foragers to spend less time and resources on vigilance individually. However, solitary species must work alone to keep watch of their surroundings, requiring individuals to expend far more energy on vigilance. Preliminary data suggests that foraging behaviors may influence the visual field of hymenopterans. We have previously concluded that reliance on nectivory decreases the blind area width in hymenopterans, and difficult predation tasks increase binocular field width. However, the influence of sociality on visual fields in hymenopterans is still widely unknown. To better understand the vision of hymenopterans and its relation to social foraging behaviors, we collected several species of local bees and wasps, and quantified the extent of their visual fields. By mounting the head of each individual to a custom-built goniometer, we were able to image the eye in pitch, yaw, and roll-under stereomicroscopy with orthodromic illumination. To measure the extent of each eye's visual field, we noted the angle of roll where the orthodromic illumination was reflected by the eye's margin at -15° pitch increments. We hypothesize that collective-vigilance and group-foraging behaviors decrease the evolutionary pressure for a wide field of vision, allowing social hymenoptera species to have less overall visual coverage around their head, but a wider range of binocular vision than solitary species. Understanding the relationship between foraging behavior and visual fields in hymenopterans could shed light on the selective forces that drive the evolution of their visual systems, as well as provide insight on the visual systems of other species.

Sun- 47

The View from the Tower: 20 Years of Seabird Counts on Great Duck Island

Eleanor J. Gnam (College of the Atlantic Island Research Center, Bar Harbor, ME) and **Wriley Hodge** (College of the Atlantic Island Research Center, Bar Harbor, ME)

Abstract - Great Duck Island (Hancock County, ME) is located 17 km offshore in the Gulf of Maine, at the boundary of the pelagic and nearshore environments. Great Duck Island is an important breeding site for 4 seabird species of interest: *Larus argentatus* (Herring Gull), *Larus marinus* (Great Black-backed Gull), *Somateria mollissima* (Common Eider), and *Cepphus grylle* (Black Guillemot). Great Duck also hosts a small number of breeding *Fratercula arctica (*Atlantic Puffin). The island's lighthouse, located within the gull colony on the south end of the island, provides an excellent vantage point for observations of breeding birds, non-breeding visitors, and birds feeding in the nearby waters. Frequently observed non-breeding species include *Morus bassanus* (Northern Gannet), *Alca torda* (Razorbill), *Oceanites oceanicus* (Wilson's Storm-Petrel), and several shorebird species. Since 2000, summer field crews have conducted daily 07:00 tower counts throughout June and July, creating a 22-year dataset of species abundance and diversity. We present some of the population trends apparent in these data. Some species have declined; for example, in 2000 the mean daily count of Black Guillemots was 252 individuals, while in 2022 the mean daily count was 111.7 individuals. Others have increased; the mean daily Herring Gull count in 2000 was 135.5 individuals, while in 2022 the mean daily count was 395.25 individuals. Other species, including *Leucophaeus atracilla* (Laughing Gull) are absent in earlier years' data, and are now frequently seen. Some of these trends are a reflection of sub-colony dynamics on Great Duck, while others may indicate shifts in abundance in the Gulf of Maine. In the rapidly warming Gulf of Maine, where food availability and habitat parameters are shifting, long-term datasets like these provide valuable insight into the response of different seabird species to their changing environment and may help reveal how future conditions are likely to impact these species.

Sat- 33

Demystifying Desmodium Distribution in Pennsylvania

Rachel K. Goad (Pennsylvania Natural Heritage Program (PNHP), Harrisburg, PA), Steven P. Grund (PNHP, Pittsburgh, PA), and Claire M. Ciafré (PNHP, Harrisburg, PA)

Abstract - In Pennsylvania, the genus *Desmodium* contains taxa that are rare and found in habitats experiencing development, disturbance, deer browsing, and invasive species encroachment. Accurate evaluation of their conservation status is needed. However, many of these taxa seem ecologically indistinct and are difficult to identify, which has led to taxonomic disagreement and distributional uncertainty. We conducted a review of taxonomic literature, built expertise through training and collaboration, conducted an extensive review of herbarium material, and collected supporting field-survey data to better understand the status of 6 taxa. We found that *Desmodium glabellum* (Tall Tick-trefoil) is far more common than previously thought, being distributed nearly throughout the state with many known extant locations. *Desmodium perplexum* (Perplexing Tick-trefoil) is much less common and has an affinity for more shaded habitats than *D. glabellum.* Its extant range appearing to be much reduced from its historic range, signaling potential conservation concern for this species. *Desmodium nuttallii* (Nuttall's Tick-trefoil) and *D. viridiflorum* (Velvety Tick-trefoil) have historically been very difficult to discern from each other in Pennsylvania. We found that most records from the state are for *D. nuttallii*, though we found a single extant occurrence for *D. viridiflorum* from Delaware County. *Desmodium obtusum* (Stiff Tick-trefoil) has possibly vanished from the state, though the identity of many historic occurrences has been confirmed. *Desmodium laevigatum* (Smooth Tick-trefoil) is extant at just 1 or 2 remaining locations in the state.

Sat- 2

NEON in the Northeast: Open Data and Samples for Understanding Changing Ecosystems

Kristin Godfrey (Battelle/National Ecological Observatory Network, Fitchburg, MA) and Marie Faust (Battelle/National Ecological Observatory Network, Boulder, CO)

Abstract - The National Ecological Observatory Network (NEON) is a continental-scale observation facility that collects long-term, open-access ecological data to better understand how ecosystems are changing across the United States. NEON has gathered 30 years of data from 81 terrestrial and aquatic field sites, including 4 sites within the Colorado Plateau and Southwest. NEON data cover a range of subject areas within ecology, including organismal observations, biogeochemistry, hyperspectral imagery, and micrometeorology. All samples and data collected by NEON are publicly available and can be accessed digitally through the NEON website. By providing free and open standardized data—along with data analysis tools, tutorials, and educational resources—NEON is engaged in the global effort to expand the scope of science and make scientific data access easier for all. NEON's field sites within the Northeast are essential to continuing the most extensive ecological data collection and monitoring program in the United States. A vast array of scientists from various disciplines within ecology have conducted research using NEON data and samples from NEON field sites in the Northeast. Many of these studies use NEON data to investigate questions that contribute to our understanding of climate change. This talk/poster will provide an introduction to NEON as well as the resources available for accessing and working with NEON data for your research, curriculum, or land management. It will also showcase published research studies that use NEON data and samples from the northeastern field sties to demonstrate how NEON science can be an integral co-benefit of protecting and preserving northeastern wildlife and natural communities. Lastly, it will highlight NEON's Assignable Assets program, which makes available components of NEON's infrastructure to outside researchers and
community members to support their research or other activities.

Sat- 56

Smile for the Camera: Patterns of Mammal Abundance in Great Hill Forest Through Four Years of Camera Trapping

Alexander Gonatas (Bridgewater State University, Bridgewater, MA) and M. Caitlin Fisher-Reid (Bridgewater State University, Bridgewater, MA)

Abstract - Understanding biodiversity through long-term monitoring is an important topic to study, because the knowledge obtained can help track populations and better understand wildlife responses to disturbances. Snapshot USA is a nationwide camera-trapping project to determine biodiversity and abundance of animal populations across all 50 states. Since 2019, participants have used camera traps to document wildlife every September and October. Since Snapshot USA participants use the same methods and trapping season, the data we collect locally can be directly compared to other Snapshot USA locations. At Great Hill Forest in Bridgewater, MA, our Snapshot USA array has used 8–10 unbaited cameras each year, spaced at least 100 m apart, during September and October from 2019 to present. For this study, we focused on 4 years of data on wild mammals (humans, domesticated mammals, and birds were removed from the data set). We estimated relative abundance for each species detected using a relative abundance index (RAI) and explored the changes in RAI over time. Over 4 years, we detected 15 species of wild mammals. Most species were detected every year, but 1 species, *Mephitis mephitis* (Striped Skunk), was only detected in 1 year (2020). Our most abundant mammal was *Sciurus carolinensis* (Eastern Gray Squirrel), and in all 4 years, Eastern Gray Squirrels, *Tamias striatus* (Eastern Chipmunk), and *Odocoileus virginianus* (White-tailed Deer) were consistently the top 3 most abundant species. Interestingly, *Urocyon cinereoargenteus* (Gray Fox) abundance was high in 2019 and 2020, but nearly zero in 2021 and 2022, while *Vulpes vulpes* (Red Fox) showed the opposite pattern. This result suggests replacement of Gray Foxes by Red Foxes. Our next step will be to compare the patterns at our site to other Snapshot USA locations to check for consistency. We also plan to generate hypotheses to explain the fluctuating patterns we uncovered, and test those using ecological modeling approaches. Finally, our camera-trap monitoring continues outside of the Snapshot USA trapping period, so we hope to further explore seasonal patterns of abundance in the future.

Sun- 16

Living Among The Ash: The Impacts of Wildfire on Wildlife Use Patterns on a *Pinus banksiana* (Jack Pine) Barrens

Casey Halloran (SUNY Plattsburgh, Plattsburgh, NY), Meghan Bargabos (SUNY Plattsburgh, Plattsburgh, NY), Danielle Garneau (SUNY Plattsburgh, Plattsburgh, NY), and Mark R. Lesser (SUNY Plattsburgh, Plattsburgh, NY)

Abstract - Disturbances such as wildfire, ice storms, and pest outbreaks significantly affect forest communities. Wildlife communities are shaped by successional trajectories that follow disturbances in terms of resource quality, quantity, and forest structure which influences predation risk. Our research aims to evaluate the extent to which wildfire disturbance has altered wildlife composition over time in a unique barrens community. The Altona Flat Rock is a ~2000-ha sandstone pavement barrens located in northern New York. Overstory at the barrens is dominated by *Pinus banksiana* (Jack Pine) with an understory of primarily *Vaccinium angustifolium* (Lowbush Blueberry) and *Gaylussacia baccata* (Huckleberry). In July 2018, a wildfire burning 225 ha occurred, providing us the opportunity to study wildlife response to disturbance, and how this response changes over time as the forest recovers, regenerates, and grows—changing structural attributes and associated habitat characteristics. Using camera trapping, we monitored wildlife occurrences between the area burned in 2018 and the adjacent unburned (66-year-old mature Jack Pine) forest from September 2018 (immediately following the wildfire) through 2023. We arranged cameras to capture differences in wildlife use patterns in both the recent burn (n = 2) and unburned (n = 2) stands. Species-specific differences in wildlife occurrences were analyzed by year, season, and time of day. Overall wildlife species richness at the Jack Pine barrens was 31 and was greater in the burned (S = 26) than the unburned (S = 22) stands. The most common species were *Odocoileus virginianus* (White-tailed Deer), *Lepus americanus* (Snowshoe Hare), and *Canis latrans* (Eastern Coyote). Immediately following the wildfire, wildlife occurrences were higher in the undisturbed stand; however, by 2020, wildlife were using both stands equally. More recently, wildlife have again shifted away from the burned area possibly due to increasing mobility constraints caused by coarse woody debris. This study provides management guidance on wildlife habitat use patterns in response to wildfire as the barrens community recovers.

Sun- 12

Vermont Atlas of Life 2013–2023: Mapping Biodiversity Now and in the Future

Michael T. Hallworth (Vermont Center for Ecostudies [VCE], Norwich, VT), Spencer Hardy (VCE, Norwich, VT), Jason Loomis (VCE, Norwich, VT), Nathaniel Sharp (VCE, Norwich, VT) and, Kent P. McFarland (VCE, Norwich, VT)

Abstract - A decade ago, Vermont Center for Ecostudies launched the Vermont Atlas of Life (VAL) to gather data on species in Vermont and help fill knowledge gaps. VAL couples the power of community science with traditional research and monitoring to quantify Vermont's biodiversity, now and into the future. VAL joins other institutions across the globe in curating occurrence records at the Global Biodiversity Information Facility. Over 8 million primary biodiversity records representing >14,000 species are in VALs repository. From this information, we are beginning to better understand changes in biodiversity. Using species distribution modeling under current and future climate scenarios, we identified where unique communities (UCs) occur across Vermont by calculating a location's (1 km^2) contribution to beta diversity. We then calculated the percent land area where UCs occur that is currently protected or under conservation easement. We assumed the conserved land parcels will remain unchanged in the future to quantify how well UCs will be conserved with future climate change. The southern Lake Champlain Biophysical region now supports UCs for over 75% of the Classes found in Vermont. Unique mammal communities had the lowest protection (39.79%) while, UCs of spiders and their allies are well protected (94.95%). Without climate abatement, the median UCs area is slightly larger than the area currently harboring them (1360.81 ± 181.75 km^2). The data gathered by VAL are crucial for conserving Vermont's species by creating a detailed picture of Vermont's biodiversity for scientists, policy makers, environmental planners, land managers, industry and the general public now and into the future.

Sun- 42

What are the Impacts of Manganese and Iron on Milkweed?

Ruth Harris (Bridgewater State University, Bridgewater, MA), **Annique Barclay** (Bridgewater State University, Bridgewater, MA), Heather Marella (Bridgewater State University, Bridgewater, MA; hmarella@bridgew.edu), and M. Caitlin Fisher-Reid (Bridgewater State University, Bridgewater, MA; mfisherreid@bridgew.edu)

Abstract - *Asclepias syriaca* (Milkweed) is a pivotal plant in the survival of *Danaus plexippus* (Monarch Butterfly) as the caterpillars of this butterfly rely solely on this plant for a source of food. However, Milkweed is disappearing in many of its natural habitats, prompting research on the best ways to replenish the plant. Previous research into the plant has highlighted the fact that the best growing conditions for this plant are largely unknown and that healthy wild Milkweed had more manganese and iron in the surrounding soil. We started the seeds in rootrainers before transplanting them to larger pots where we treated each sprouted Milkweed weekly with one of the following nutrient solutions: either high manganese, low manganese, high iron, low iron, or a modified Hoagland base nutrient solution. After the plants were treated with solution for 5 weeks, we moved 5 plants of each treatment group to butterfly nets containing 4 *Oncopeltus fasciatus*(Large Milkweed Bug) each and then recorded the visible signs of stress of Milkweed plants over a period of 2 months. By week 1 of adding bugs to the plants, the treatment group that showed the least signs of plants distress was high manganese, with 3 out of the 4 plants showing no signs of distress. The treatment groups with the most plant distress were low iron and low manganese with all 8 plants showing distress in the form of fallen leaves, yellowing, and wrinkling. Based on the results of this study we hope to next include a fecundity assay and include herbivory from the Monarch Butterfly caterpillars.

Sun- 2

Put a Ring on it: Effects of Climate Change on Growth of *Pinus banksiana* and *Pinus rigida* at Opposing Range Margins

Zachary Hart (SUNY Plattsburgh, Plattsburgh, NY), Madelyn Lehman (SUNY Plattsburgh, Plattsburgh, NY), Linh Le (SUNY Plattsburgh, Plattsburgh, NY), Michael Hurban (SUNY Plattsburgh, Plattsburgh, NY), and Mark Lesser (SUNY Plattsburgh, Plattsburgh, NY)

Abstract - Species range margins may indicate climatic (i.e., temperature and precipitation) niche limits that species cannot grow beyond. Ongoing climate change is shifting climate spaces, potentially creating conditions unfavorable to a species at a given location—particularly at or near a current range margin. Further, the response to changing climate may be dramatically different depending on the geographic position of the range limit (i.e., polar vs. equatorial). To study how species are dealing with climate change at their range margins, we assessed annual growth trends in 2 long-lived tree species, *Pinus banksiana* (Jack Pine) and *Pinus rigida* (Pitch Pine) at the Altona Flat Rock in northern New York. At this site, Jack Pine is near its southernmost limit, while Pitch Pine is near its northernmost limit. We hypothesized that with warming climate, conditions may be becoming unsuitable for Jack Pine while Pitch Pine will potentially thrive with warming temperatures. We collected cores from ~200 Jack Pine and ~100 Pitch Pine. All cores were measured and crossdated using standard dendrochronological techniques. We modeled annual ring-width against a suite of regional temperature and precipitation variables to determine what factors each species was responding to over time. Preliminary results showed that Jack Pine growth has remained relatively stable over the past century, while Pitch Pine showed an increasing trend in growth since the 1960s. However, over the past ~10 years, both Jack Pine and Pitch Pine showed decreasing growth trends. Jack Pine showed a low correlation with both temperature and precipitation, suggesting that climate is not a determining factor for growth at this site, and its southern range limit may be set by other factors. Pitch Pine showed a stronger correlation to climate, with fall temperature and annual precipitation having the largest influence on growth. This study will increase our knowledge of how tree species are responding to ongoing climate change and inform management decisions in regard to species vulnerability and forest biodiversity along range margins.

Sun- 9

Behavioral and Hormonal Responses by Planorbid Snails to Temporal Patterns of Predation Risk

Katherine Hawley (Utica University, Utica, NY), **Morgan Rynkiewicz** (Utica University, Utica, NY), **Gillian Bradley** (Utica University, Utica, NY), Sara Rachon (Utica University, Utica, NY), Alyssa Tyczka (Utica University, Utica, NY), and Thomas M. McCarthy (Utica University, Utica, NY)

Abstract - Planorbid snails have several distinct behavioral responses to chemical cues indicating predation risk. We used a 3 x 2 experimental design to compare snails' responses to levels of risk (3) and temporal variation (2). We created cues simulating high predation risk using water mixed with injured snails and cues suggesting low predation risk using both plain tap water and water from a tank of healthy snails. We predict that when repeatedly exposed to the chemical stimulus at the same time every day, these responses will decline in frequency and intensity when compared with animals who experience the stimulus at random time intervals. As a measure of stress response, we also predict that the corticosterone levels will be lower in individuals that had same-time exposure. We are currently analyzing temporal behavioral data and hormone assays.

Sun- 51

Not Just Mothballs: An Expedition to Modernization for a Small Natural History Collection

Julia Hebert (Bridgewater State University, Bridgewater MA) and Maria Armour (Bridgewater State University, Bridgewater MA)

Abstract - Housed at Bridgewater State University, the Vertebrate Natural History Collection (BSUNH) is an extensive assemblage of specimens. Since its inception in 1965, our collection continues to grow through gifts from regional institutions and through faculty and students' acquisition of specimens. Over the last decade, BSUNH has remained relatively static due to staffing issues and budgetary constraints. This academic year was different because there was an addition of a graduate assistantship dedicated to BSUNH. Hired in this role, I am tasked to assist curatorial staff in modernizing our collection. As a staff of 2, our main goal is to make the collection accessible to everyone, within and outside the campus community. We also plan to implement a digital database management system, PassPerfect. Along with incorporating the collection into laboratory education at BSU, we strive to incorporate more morphological, taxonomic, and phylogenetic research that uses the collection. We understand that our collection holds enormous value, but currently are unaware of the specificity of each specimen's value. Starting the collection evaluation with so few staff is not ideal, and we knew we needed to work efficiently to see any modernization in the foreseeable future. We decided to take the evaluation process one step at a time and start with our smallest and oldest collection, Ornithology. We wrote and implemented a standard operating procedure (SOP) on specimen handling and collection management. Creating and establishing an SOP for each collection is a goal we are achieving in real time and will allow an easier and more organized evaluation of our other taxa. As new students begin working in the museum, SOPs will allow them to have an easier transition to the art of curation at BSU. We are taking steps to modernize our collection and seeing the potential it holds in the STEM community. Using this forward momentum, we plan on connecting with the public through increasing our social media presence, refining our mission statements, and continuing the effort in strategically managing the collection to increase its quality and value.

Sun- 22

Spillover of Protozoal Pathogens into and out of an Invasive Bird Species: A One Health Problem

Matt Heilbronn (UVM, Burlington, VT) and Ellen Martinsen (UVM, Burlington, VT)

Abstract - The increase in pathogen spillover and subsequent emerging infectious disease threatens the health of humans, domestic animals, and wildlife alike. As we are often clued into pathogen spillover events only after they occur, the environmental precursors surrounding their occurrence are not well studied in nature. It is likely that spillover is not homogenous across the landscape and that human land-use change and habitat alteration are involved. In this study, I investigate the malaria parasites (genus *Plasmodium*) that have spilled over into the introduced and now widely invasive bird species, the *Passer domesticus* (House Sparrow) at various dairy farms across northern Vermont over time. Through PCR screening, DNA sequencing, and GIS analysis, I document the prevalence and diversity of malaria parasites in House Sparrows at the diversity of sites sampled. Through this study, I aim to identify the possible habitat factors involved in pathogen spillover.

Sun- 50

Changing Bat Activity Across Massachusetts Due to Anthropogenic Sound Shifts

Franchesca Heine (Bridgewater State University, Bridgewater, MA) and Maria Armour (Bridgewater State University, Bridgewater, MA)

Abstract - Anthropogenic influences on New England bats (Order: Chiroptera) are a conservation concern since bats are an ecological indicator and human activity is directly linked to ecological disruption. Our research focus is to understand how a human population lockdown may have affected regional bat activity, distribution, and species richness. It has been well documented that anthropogenic pressures such as light and sound pollution have resulted in regional population decline in both hibernating and migrating bat species. The 2020 government lockdowns due to the COVID-19 Pandemic had substantially lowered the anthropogenic noise across the country. Our research sets out to answer the question "what biological effects do anthropogenic sounds have on bat distribution and nightly activity in variable habitats across Massachusetts?" This state is home to 9 bat species, all insectivorous and all belonging to the family Vespertilionidae. Over the last 3 summer seasons, we have collected bioacoustic data at 2 habitats spanning Massachusetts (MA): a forested habitat in the Berkshire Mountain range and a suburban habitat located on a university campus in southeastern MA that is adjacent to a railroad. The western MA forested site is our control site, as there was no evidence of noise level or light changes throughout the 3 seasons. We analyzed individual bat calls from our research sites to identify species and activity level during the summer months. This data allows for the comparison of species richness and activity between different habitats over the span of 3 summer seasons as well as comparing lockdown and post-lockdown bat abundance. This research is in the preliminary stages; however, we predict that our data will show that bat activity was higher during lockdown at the suburban site due to the decrease in anthropogenic sound influences.

Sun- 18

Soil-dwelling Invertebrates in Farmland Transitioning from Intensive Agriculture to Native Meadows

Alyssa L. Hotchkiss (SUNY Cobleskill, Cobleskill, NY), Carmen Greenwood (SUNY Cobleskill, Cobleskill, NY), Claudia Knab-Vispo (Hawthorne Valley Farmscape Ecology Program), Conrad Vispo (Hawthorne Valley Farmscape Ecology Program), and John Pipino (SUNY Oneonta, Oneonta, NY)

Abstract - Soil-dwelling organisms are widely diverse and provide a plethora of ecosystem services, including nutrient cycling, decomposition, and pest suppression. Diversity, abundance, and community composition of microarthropods act as indicators of soil health. Such information can be used to make land-management decisions in an agricultural setting. At the Hudson Valley Farm Hub in Hurley, NY, researchers are interested in the establishment and monitoring of perennial beneficial habitats on former intensively managed farm fields. This study is part of a larger effort, the Native Meadow Trial (NMT), documenting the development of beneficial above- and below-ground arthropod communities in tandem with changes in vegetation and soil conditions. The NMT consists of 12 rectangular, 0.2-ha (0.5-ac) plots representing 3 replicates of 4 different treatments (seeded with native wildflowers, seeded with native grasses, fallow control, and hay control). We collected soil samples from each plot (n = 12) to extract microarthropods using Tullgren funnels and quantify soil moisture/organic matter content through the loss-on-ignition method. In 2022, we collected a total of 6593 organisms representing 52 different taxa, 18 of these taxa were mites, with 8 representing oribatid mites, a taxon known to be sensitive to disturbance. Overall, abundance was highest in the native grasses treatment for June (100.33 ± 16.32) and fallow control for July and August (147.50 ± 22.9 and 105.83 ± 9.4, respectively). Taxa richness levels were highest in the native wildflowers, native grasses, and fallow control plots during July (18.17 ± 1.05, 16.17 ± 0.83, and 18.00 ± 0.82, respectively). Taxa richness levels were the same in the hay control plots for July and August (16.00 ± 2.14 and 16.00 ± 1.24, respectively). Since the beginning of this study in 2020, we have documented an increase in the abundance of soil-dwelling organisms across all treatments and shifts in their community composition, to include larger proportions of sensitive taxa. The goal of this project is to monitor these critical communities and to explore potential interactions between the diversifying flora and fauna communities, both above and below ground within these regenerating systems.

Sat- 8

Diet of Connecticut Bobcats via DNA Metabarcoding

Kimberly A. Hughes (Louis Calder Biological Field Station, Fordham University, Bronx, NY), Carol S. Henger (Louis Calder Biological Field Station, Fordham University, Bronx, NY), Jason Hawley (Connecticut Department of Energy and Environmental Protection, Hartford, Connecticut; University of Connecticut, Department of Natural Resources and the Environment, Storrs Mansfield, Connecticut), Tracy A.G. Rittenhouse (University of Connecticut, Department of Natural Resources and the Environment, Storrs Mansfield, Connecticut), and Jason Munshi-South (Louis Calder Biological Field Station, Fordham University, Bronx, NY)

Abstract - DNA metabarcoding on stomach contents offers a more accurate way to investigate the diet of predators, and increases taxonomic breadth compared to traditional microhistological and/or morphological methods. The diets of predators living in fragmented landscapes can be important to understanding the structuring of entire communities. Individual diet variation of *Lynx rufus* (Bobcat) can provide information on sources of mortality for prey species, as well as explain possible mechanisms for mitigating intraspecies competition, which can allow for efficient use of land and resources by a solitary carnivore species. We examined the diet of Bobcat in Connecticut using DNA metabarcoding on stomach contents. Of the 63 samples sequenced, most stomachs contained between 2 and 5 species. *Sylvilagus floridanus* (Eastern Cottontail) and *Sciurus carolinensis* (Eastern Gray Squirrel) were each found in over 80% of samples, and most remaining taxa were other small mammals. The Bobcats consumed *Odocoileus virginianus* (White-tailed Deer) nearly a third of the time. Additionally, *Neovison vison* (American Mink) and *Gallus gallus domesticus* (Chicken) were identified in multiple samples. Consumption of American Minks, Chickens, and White-tailed Deer could not be related to season or sex of the Bobcat. Only mink consumption was significantly associated with body weight of the Bobcats. This study mostly confirms previous work on Bobcat diet. However, it also provides important insight into a potential source of human–wildlife conflict and contributes to understanding of potential controls on White-tailed Deer populations.

Sat- 48

A New Estimate of Biocrust Contribution to Carbon and Nitrogen Flux in Global Terrestrial Ecosystems

Shloka V. Janapaty (Columbia University, New York, NY), Erwan Monier (UC Davis, Davis, CA), Emilio Rodriguez-Caballero (Max Planck Institute of Chemistry, Mainz, Germany), Betttina Weber (Max Planck Institute of Chemistry, Mainz, Germany)

Abstract - Biocrusts are communities of photoautotrophic organisms, such as cyanobacteria, lichen, and bryophytes, that are found ubiquitously in terrestrial ecosystems and play a vital role in regulating carbon and nitrogen fluxes at a local scale. Despite their importance, the global contributions of biocrusts to carbon and nitrogen fluxes are not well understood and estimates from over a decade ago need to be updated. This study analyzed 362 flux records from 1976 to 2021 to derive updated estimates of carbon and nitrogen uptake by biocrusts. We estimate that biocrusts absorb 3.07 Pg of carbon and 102.33 Tg of nitrogen annually, accounting for 7 percent of terrestrial primary productivity and over 50 percent of biological nitrogen fixation. We used random forest regression analysis and Landsat 8 spectral bands to identify drivers of flux with root mean square error of 4.59% and ERA5 reanalysis to predict flux for forecasted climatologies. Sensitivity analysis indicated that in-situ flux measurements are sensitive to temporal and geospatial scaling factors, with up to 86 percent error in predictions. Our findings dramatically update previous estimates of biocrust contributions to global biogeochemical cycles and highlight the need for future research to sample data from understudied ecosystems.

Sat- 6

Long Distance Spruce Grouse Translocations as an Effective Means of Population Recovery in New York

Glenn Johnson (SUNY Potsdam, Potsdam, NY), Angelena Ross (NY Department of Environmental Conservation, Potsdam, NY) , David Selner (NY Department of Environmental Conservation, Potsdam, NY), Ellen Norton (NY Department of Environmental Conservation, Potsdam, NY), and Thomas Langen (Clarkson University, Potsdam, NY)

Abstract - Species translocations can be an effective tool for population recovery. *Falcipennis canadensis* (Spruce Grouse) is rare at the southeastern extent of its range. In New York, it is endangered, having a geographic range that has decreased more than 70% since 1977 and a remaining population with relatively low genetic diversity. We explored the efficacy of a translocation program by releasing 144 female, 19 male, and 291 young-of-year wild-caught Spruce Grouse from Canada and Maine into occupied lowland boreal forest patches in New York from 2013 to 2019. We radio-monitored 121 translocated and 93 resident (i.e., New York-origin) adult grouse and evaluated movements, home-range sizes, productivity, and survivorship of both groups. Translocated grouse generally moved nondirectionally across the landscape after release, remaining in the same boreal forest patch or an adjacent patch. Translocated grouse home ranges were stable but were double the area of resident grouse. Clutch and brood sizes of females the season following translocation were similar to resident grouse. Minimizing stress from handling and housing was of paramount importance for successful translocation; grouse held captive in enclosures with natural vegetation for ≤5 days had double the mean annual survivorship of captive grouse held for 6–10 days. One group held captive for 15 days had annual survivorship that approached zero. Translocated grouse that were handled the shortest duration had 72% of the mean annual survivorship of resident grouse. Similarity of life-history parameters among groups suggests that translocations of wild-caught Galliformes into shrinking populations at range margins may be an effective means of augmenting population numbers and could be a useful tool for reversing declines and promoting population recovery. Long-term success of Spruce Grouse translocations with a goal of population recovery in New York may hinge on survivorship meeting target estimates defined in population viability analyses or by the adjustment of target translocation numbers to compensate.

Sat- 25

Using Herbaria to Track Phenology Changes in Northeast Spring Ephemerals

Peter Kaires (East Stroudsburg University, East Stroudsburg, PA) and Emily Rollinson (East Stroudsburg University, East Stroudsburg, PA)

Abstract - Climate change is altering environmental conditions for many organisms and ecological communities, potentially leading to changes in the natural history of many species. Many phenological shifts have been documented in response to changing seasonal patterns, including shifts to earlier flowering time in many plant species. Spring ephemeral plant species are of particular interest in studying flowering phenology as they are some of the first plants to arise in the spring and their entire life cycle is completed not long after flowering. To assess phenological change in *Erythronium americanum* (Yellow Trout Lily), we will examine historical and modern herbarium specimens of this spring ephemeral spanning 133 years and drawn from both the ESU herbarium collection and additional regional herbaria. We will also explore the use of other plant-occurrence records, outside of herbarium records, in assessing phenological change.

Sat- 4

Bat Activity is Related to Habitat Type and Structure in Managed Barrens in New England

Natalie Kay (Worcester Polytechnic Institute, Worcester, MA), **Amelia Sadlon** (Worcester Polytechnic Institute, Worcester, MA), and Marja Bakermans (Worcester Polytechnic Institute, Worcester, MA)

Abstract - Several insectivorous bat species are found in New England, yet research on them is still scarce. Pine barrens are an uncommon ecosystem that supports other rare taxa, and could be important for these bat species. With hand-held audio recorders, we surveyed for bats in the Montague Plains Wildlife Management Area in Massachusetts and Concord Pine Barrens in New Hampshire. Our study objectives were to (1) describe the most common bat species and (2) compare bat activity across different habitat types at 2 managed pine barrens in New England. We analyzed our data through linear mixed effects modeling and Fisher's exact tests, finding significance ($P < 0.05$) in bat activity versus habitat types and structure. Overall, we were able to measure the presence of 5 out of the 9 total species found in the area, including the endangered *Myotis lucifugus* (Little Brown Bat). The index of bat activity was highest in *Pinus rigida* (Pitch Pine) and hardwood forests and lowest in scrub oak and thinned pitch pine habitats. From preliminary data, we also detected greater bat activity in areas that had not been burned recently. Implications of these findings include the general importance of pine barrens as an ecosystem that supports bats, and prioritizations that may be made in conservation efforts based on the correlation of bats in our study to closed-canopy habitat types. Further research is recommended to better understand the relationship between prescribed fires that are common in managed pine barrens and bat activity.

Sat- 45

Impact of Lawn Maintenance on Insect and Plant Biodiversity

Mary Keating (SUNY Potsdam, Potsdam, NY) and Kate Cleary (SUNY Potsdam, Potsdam, NY)

Abstract - There are about 40 million acres of maintained lawn in the US. Grass lawns require constant maintenance and use of excessive amounts of water, fossil fuels (to power lawn equipment), and pesticides. Additionally, maintained lawns are areas void of biodiversity that are uninhabitable to most wildlife. We measured differences in plant and insect biodiversity in 2 locations on SUNY Potsdam's campus: a location that was mowed weekly and another that was only mowed once throughout the season (low-mow). We hypothesized that both plant and insect species richness and insect individual abundance would be higher in low-mow plots than in the mown plots. We established 2 mown and 2 low-mow plots in each location. We sampled each plant species present in each plot at both locations once using sweep nets for insects. We identified plant samples to species and insect species to order. Preliminary results show that insect order richness and individual abundance were higher in low-mow plots, which supported our hypotheses. Contrary to our hypotheses, plant species richness was higher in mown plots. This is a long-term project on SUNY Potsdam's campus that will be continued in coming years. This research provides a foundation of data to present to SUNY Potsdam in hopes of making changes to their land use and reducing the area of mown lawn on campus.

Sat- 13

Integrating Undergraduates and Non-Academics into Large-Scale Research by Exploring Phenological Asynchrony of Vernal-Pool Breeding Amphibians and Woody Plants

Mary Beth Kolozsvary (Siena College, Department of Environmental Studies and Sciences, Loudonville, NY), Jennifer Purrenhage (University of New Hampshire, Department of Natural Resources and the Environment, Durham, NH), David Steinberg (University of New Hampshire, Department of Biological Sciences, Durham, NH), and Thilina Surasinghe (Bridgewater State University, Department of Biological Sciences, Bridgewater, MA)

Abstract - Providing undergraduate students with hands-on, authentic research experiences that address large-scale ecological questions is a powerful way for students to grasp how ecological relationships interact across multiple spatial scales. Research directed at understanding how climate change is affecting phenology of co-occurring phylogenetically distant species provides an excellent opportunity for students to make those connections. Phenological shifts of co-occurring species do not necessarily happen at the same rate, magnitude, or in the same direction, and phenological mismatches can disrupt critical community interactions. An interesting potential mismatch to explore is early spring phenology of the pond-breeding amphibians *Lithobates sylvaticus* (Wood Frog) and *Ambystoma maculatum* (Spotted Salamander) and woody plants surrounding their breeding pools. Geographic and landscape drivers of phenology—particularly with respect to pond-breeding amphibians and woody plants surrounding forest ponds—is not well understood, and it is unclear what factors drive phenology shifts—local, landscape, or a combination of both. To address these questions, we designed protocols for coordinated multi-site, multi-year data collection to incorporate into undergraduate coursework or independent research experiences, or to implement in non-academic settings. In 2022, we launched a Vernal Pool Phenology Project (VPPP) pilot study through the Ecological Research as Education (EREN) network to gather coordinated phenology data across a large geographic region. We collected data twice-weekly during a 6-week sampling period at 7 vernal pools across 5 institutions. Field research site setup and data collection were conducted in 10 undergraduate courses and with several independent research students. Data collected included initial egg-deposition date for Wood Frogs and Spotted Salamanders, phenology stage of dominant trees surrounding the pool, water-level fluctuations, and maximum depth. We measured canopy cover, used data loggers to measure water and air temperature, and determined pool dry date. In 2023, we deployed acoustic recorders at a subset of sites to document Wood Frog calling phenology, and expanded to 25 additional sites that include several non-academic partners and volunteers. By designing protocols for undergraduate and a variety of other learning settings, we have brought local field-data collection and large-scale science into undergraduate field courses and broadened the reach of multi-site ecological research to other non-academic partners.

Sun- 24

Engaging Undergraduates in Natural History Research Through CUREs Using Digitized Collections Data

Janice L. Krumm (Widener University, Philadelphia, PA), **Kathryn M. Weglarz** (Westfield State University, Westfield, MA), Carly N. Jordan (George Washington University, Washington, DC), and Cecily D. Bronson (Delaware Museum of Nature and Science, Wilmington, DE)

Abstract - Digitized natural history collections (dNHC) data is a unique, growing, and important resource in reducing student barriers to ecology and evolution research opportunities. Digitized collections data can contribute to expanding research opportunities for undergraduates across institution types including community colleges and institutions without traditional laboratory facilities. dNHC data is publicly accessible through data aggregators including iDigBio and GBIF, and can be combined with free scientific software, including ImageJ and QGIS, allowing students to address cutting-edge research questions. Biological Collections in Ecology and Evolution Network (BCEENET) is a community of undergraduate educators and researchers, collections professionals and researchers, and data experts committed to increasing equity in undergraduate research experiences through Course-based Undergraduate Research Experiences (CUREs). BCEENET has created 4 accessible and highly flexible CUREs using dNHC data that can be implemented in online, hybrid, and in-person formats. These CUREs require only student access to a computer and the internet, allowing implementation at diverse institutions. These CUREs have been implemented at over 30 colleges and universities, including community colleges, primarily undergraduate institutions, research universities, and minority-serving institutions. In this presentation, we will describe the 4 BCEENET CUREs and discuss how they can be used to engage a new generation of STEM students with natural history collections, conveying the importance and uses of these resources in current scientific research endeavors. We will also discuss opportunities to collaborate with BCEENET through implementation of a CURE, development of new CURE materials, and assessment of the impact of these CUREs on student learning and student science identity. Please visit bceenetwork.org to learn more about our resources and our network.

Sat- 54

Prevalence of Parasitic Mites on *Odonata* Hosts in Clinton County

Allison LaPoint (SUNY Plattsburgh, Plattsburgh, New York), Neil Buckley (SUNY Plattsburgh, Plattsburgh, New York), and Alyssa Gleichsner (SUNY Plattsburgh, Plattsburgh, New York)

Abstract - *Odonata* are a substantially diverse order of insects that includes *Zygoptera* spp. (damselfly species) and *Anisoptera* spp. (dragonfly species.) *Odonata* are commonly hosts to parasitic mites. The use of demographic research of the *Odonata* order has been largely used to obtain evidence for the co-evolution of parasites and their hosts. The aim of this study is to continue to observe the parasitic relationships between mites and *Odonata,* with interest in samples within Clinton County, NY. We took length, sex, species, and other characteristics into account as factors that may contribute to parasitism in these hosts. In the past, these factors have been common attributes that affected the prevalence and intensity of parasitism within this order. Data suggests associations between sampling locations and mite prevalence, as well as negative correlation between body size within *Anisopterans* and intensity of infection. In general, the presence of parasitic mites is higher in *Zygopterans.* The goal of this on-going study is to further contribute data to this subset of research to continue to observe potential co-evolutionary evidence in the field of ecological entomology.

Sun- 40

Biodiversity of Great Hill Forest: A Baseline Inventory

Audrey Lawrence (Bridgewater State University, Bridgewater, MA), **Blake Page** (Bridgewater State University, Bridgewater, MA;), Alex Gonatas (Bridgewater State University, Bridgewater, MA), and M. Caitlin Fisher-Reid (Bridgewater State University, Bridgewater, MA)

Abstract - In summer 2022, we began a systematic biological survey of Bridgewater State University's Great Hill Forest (Bridgewater, MA). The goal of this project is to collect data on the presence of resident plants, animals, and microbial communities in Great Hill Forest to determine overall species richness and have a baseline inventory from which to continue monitoring species' abundance. We collected presence data on native and non-native plants, mammals, birds, microbial communities, and leaf-litter invertebrates at eight 5 m x 5 m plots distributed throughout the Great Hill Forest, as well as through transects along the trail edges. We used techniques such as leaf-litter sampling, trail cameras, wildlife audio recording, microbial DNA extraction from soil samples, and identification websites like iNaturalist and Wildlife Insights. By the end of summer 2022, we had cataloged an overall species richness of 105 species within the Great Hill. Some of these species were extremely common, showing up in every plot, while others only showed up in 1 or 2 areas of the forest. We are continuing to process additional samples from both microbial DNA using 16s sequencing and from audio files using the software Kaleidoscope Pro by Wildlife Acoustics. Once we have completed cataloging species from these additional samples, we can begin analyses to better understand the distribution of particular species in our forest in relation to environmental factors like light availability, soil nutrient levels, or habitat complexity.

Sun- 5

Not Just a Number: How Disturbance History has Shaped Temporal and Spatial Forest Structure at the Altona Flat Rock

Madelyn Lehman (SUNY Plattsburgh, Plattsburgh, NY), Zach Hart (SUNY Plattsburgh, Plattsburgh, NY), and Mark Lesser (SUNY Plattsburgh, Plattsburgh, NY)

Abstract - Forest structure plays an important role in ecosystem function. Further, structural diversity across a landscape may lead to emergent properties that affect community and ecosystem characteristics as well as vulnerability and resilience to future disturbance. Across a given landscape the legacy of past disturbances (i.e., wildfire) gives rise to different aged forest patches that in turn differ in structure and in resilience and recovery potential following new disturbances. It's important to understand disturbance-structure interactions across time and space, and how they affect ecosystem properties (i.e., carbon sequestration or wildlife habitat). The objective of this study was to determine how past disturbances shaped the landscape at the Altona Flat Rock pine barrens in northern New York. The Flat Rock is a ~2000-ha globally rare sandstone pine barrens dominated by *Pinus banksiana* (Jack Pine), a serotinous species dependent on fire to open cones, release seed, reduce understory competition, and expose mineral soil. Portions of the Flat Rock burned in 1919, 1940, 1957, and 2018, but the exact extents and spatial configuration of each disturbance is unknown. To understand the spatial arrangement of stand ages at the Flat Rock, we increment-cored 3 trees at each of 3 randomly selected sites within each of twenty 1-km^2 grid cells spanning the Flat Rock (60 sites in total). Because we are interested in age of tree establishment, we cored all trees as low to the root collar as possible and recorded the height the core was taken. We cored a subset of trees a second time 10 cm higher than the first core. We will model difference in age between the 2 cores against height to determine annual growth rate. We will use this model to calculate the offset between age at coring height and root collar (establishment age). Finally, we will use GIS to spatially interpret age structure across the landscape. Determining the spatial arrangement of different stand ages at the Flat Rock will provide insight into the landscape-level response and resilience to future disturbances, along with providing context for changes in forest structure and associated wildlife and bird habitat.

Sun- 7

Creating Accurate Clay Salamander Molds for In-Class Learning Modules on Polymorphism and Predation

Grace Leopold (Bridgewater State University, Bridgewater, MA) and M. Caitlin Fisher-Reid (Bridgewater State University, Bridgewater, MA)

Abstract - Clay models are often used in ecological research to measure predation in the field because the clay records both the number of attacks and the type of attacker through teeth/beak impressions. The goal of this project is to create accurate molds for making clay salamanders that can be mass distributed to educators to be used for in-class learning modules. The learning module focuses on understanding color polymorphism in *Plethodon cinereus* (Red-backed Salamander) by measuring levels of predation on the 2 color morphs (striped, unstriped). Students will create their own clay salamanders in the classroom, then, these salamanders will be placed in the field and observations will be made regarding predation rates between the 2 morphs. A mold that can be distributed to classes will make clay salamander consistency between student groups easier to manage. We found oil clay to be best suited due to its ease of use and affordability. For making molds, we tested poured silicone and 3D printing. Poured-silicone molds have many advantages. They are affordable, easy to make and work well with clay. We have found that this process would not be difficult to replicate in classrooms, and were able to generate 80 clay salamanders in 3 months. This spring, we hope to test our clay salamanders by deploying them in field. Based on this test, we will revise the learning module and produce a model-making guide to accompany the lesson plan. Once this project comes to completion, it will serve as a hands-on learning experience for students of all ages in the field of ecology and biological evolution. It will also serve as a resource to educators who are looking for an exciting way to teach key concepts both inside and outside of the classroom.

Sun- 23

Correlation in Abundance Between the Invasive Asian Shore Crab and its Prey

Nick Loonie (Bridgewater State University, Bridgwater, MA), Franchesca Rolon **(**Bridgewater State University, Bridgwater, MA), Eva Rando **(**Bridgewater State University, Bridgwater, MA), and Christopher P. Bloch **(**Bridgewater State University, Bridgewater, MA)

Abstract - *Hemigrapsus sanguineus* (Asian Shore Crab) is an invasive species that has become the most abundant brachyuran crab in rocky intertidal zones in most of New England and the Mid-Atlantic coast of North America. It has had substantial effects on the abundance of other intertidal invertebrates, as it is a voracious predator and aggressive competitor. However, invasive species sometimes self-limit their populations by over-consuming their most energetically profitable prey, thereby limiting their own growth and fecundity. Using plot-sampling data collected at 12 sites from 2014 to 2022, we tested for relationships between abundance of the Asian Shore Crab and abundance of 3 other intertidal invertebrate species that are common on rocky shores in Massachusetts and Rhode Island: *Carcinus maenas* (Green Crab), *Mytilus edulis* (Blue Mussel), and *Littorina littorea* (Common Periwinkle). In general, Asian Shore Crab abundance was not strongly correlated with that of the Green Crab or Blue Mussel, but was weakly but significantly negatively correlated with abundance of the Common Periwinkle. Abundances of the Blue Mussel and Common Periwinkle correlated positively, suggesting that similar environmental conditions promote the success of both species. The lack of a clear, consistent effect of Asian Shore Crab abundance on other common invertebrates suggests a complex interaction between population dynamics of an invasive predator and the degree of predation pressure it exerts on common and preferred prey. Additional studies that directly address energetics and fecundity will help clarify these relationships.

Sun- 54

Barnard Undergrads Studying the NYC Environment: Climate Science, Biodiversity, Environmental Justice

Terryanne Maenza-Gmelch (Barnard College, New York, NY)

Abstract - Introduction to Environmental Science uses current local and global headlines as a context for examining the principles of ecology and environmental science with a focus on climate science, biodiversity conservation, and environmental inequities. Three examples of the curriculum we use at Barnard College are presented here: carbon sequestration in campus trees, biodiversity on a campus green roof, and tree-canopy disparity in red-lined communities. Carbon storage in campus trees has been measured since 2015. Using diameter measurements, biomass equations and Excel, students calculate the amount of carbon stored in campus trees and growth rates of individual species. Students compare carbon sequestration in trees with carbon emissions from various types of transportation and think about which tree species has the potential to sequester carbon the most rapidly based on growth rates. Quantification of biodiversity on a green roof at Barnard College uses vegetation plots, plant-identification keys, and biodiversity-index calculations in Excel. Plots include plants typical of rocky summits, plains, and pollinator gardens. Students record species presence and abundances and observe plant–pollinator interactions. Associated readings address the drivers of biodiversity loss and how climate change and invasive species factor into biodiversity loss. Students are asked to write about the status of biodiversity in their hometown. Canopy disparity in red-lined neighborhoods and the associated loss of benefits provided to people are explored through maps, readings, and discussion boards. Students learn that the ecological processes of photosynthesis and evapotranspiration are the mechanisms by which some of these benefits are provided to humans. For example, pollutants like nitrogen dioxide and ozone pass into the same stomata in leaves that trees use to exchange oxygen and carbon dioxide with the atmosphere in photosynthesis. In addition, evapotranspiration facilitates the cooling that benefits people and mitigates urban heat-island effects on neighborhoods that are fortunate to have an abundance of trees. Students are asked to reflect on environmental injustices by using the discussion board in small groups to comment about readings and share about the injustices they have observed in their hometown communities.

Sat- 53

***Sphagnum*-associated Nitrogen Fixation in New England Peatlands**

Adelaide Mahler (Middllebury College, Middlebury, VT) and Kirsten Coe (Middllebury College, Middlebury, VT)

Abstract - Life is inextricably linked to nitrogen, yet most nitrogen exists in a biologically unavailable form, gaseous N_2. N_2 is converted into NH_4^+, readily taken up by plants and microbes, through nitrogen-fixation as facilitated by diazotrophic bacteria, notably cyanobacteria. Using coupled microscopy and N^{15}-enriched incubations, we established the presence of cyanobacteria colonies across species of *Sphagnum* moss and quantified associated nitrogen fixation in 3 temperate peatlands. Data collection was distributed along a latitudinal gradient from Massachusetts to Northern Vermont over the course of the growing season (June–September) and included intra-peatland dynamics reflective of bog heterogeneity including microtopography and changing "ecozones" across transects from the center to edge of each bog. This holistic approach to sampling revealed correlations between abiotic factors (temperature, humidity, and precipitation) and the rate of moss-associated nitrogen fixation, highlighting the control of more immediate weather conditions on the nitrogen-fixing performance of cyanobacteria and presenting the potential for defining distinct niches of certain species when and where nitrogen fixation is optimized.

Sat- 5

Impact of Climate Change on the Respiration of a Freshwater Producer *Lemna minor* and Invertebrate *Libellulidae*

Clara I. Marler (University of Saint Joseph, West Hartford, CT) and Kirsten Martin (University of Saint Joseph, West Hartford, CT)

Abstract - Aquatic ecosystems have experienced notable changes in response to the exponential effects of climate change. Low trophic levels indicate the health of an overall habitat, thus serving as essential indicators to predict issues to the health of all organisms. While marine habitats have gathered increasing attention, smaller freshwater habitats hold the same degree of importance. To further explore the reactions of a smaller-scale freshwater ecosystem, we analyzed differences in the respiration, physiological, and behavioral responses that environmental changes have on producers and primary consumers. Our study exposed *Lemna minor* (Duckweed) and *Libellulidae* dragonfly nymphs to both physical and atmospheric abiotic change: alterations of temperature, and phosphorus and nitrogen levels. Sealed biochambers containing identical weights of each separate organism, consisting of 1 control and 2 replicates each, were exposed to exponentially increasing change. Trials were completed for a week with the factor increased every 2 days. We measured biochamber conditions such as pH, carbon dioxide, oxygen gas, and dissolved oxygen using digital monitors and their respective probes. We hypothesized that the both Duckweed and dragonfly nymphs would display growth inhibition and decreased respiration. While the Duckweed and dragonfly nymphs did not display significant alterations to their respiration, their growth and health was greatly decreased by the alterations. The control dragonfly nymphs grew close to twice as much as the organisms in altered conditions, and the altered Duckweed developed unhealthy coloration. We propose that the concluded growth inhibition and decline in health are due to the inability to tolerate habitat alterations due to climate change.

Sun- 28

Testing an Origin Hypothesis for the Costa Rican Tetraploid *Polystichum talamancanum* with the Hybphaser Pipeline

Julia McClafferty (UVM, Burlington, VT) and David Barrington (UVM, Burlington, VT)

Abstract - The product of speciation via an allopolyploid derivative of a sterile hybrid is a genetically distinct lineage combining the genomes of its progenitors. Conventional phylogenetic analyses representing divergence histories cannot accurately capture the relationships in allopolyploid complexes. The tropical Andes and southern Central America harbor an unusually intricate complex of *Polystichum* species, hybrids, and polyploids whose relationships have proved refractory to standard analysis. Here we use target-sequence capture and read-to-reference phasing with the bioinformatics workflow Hybphaser to approximate phased haplotypes of *Polystichum talamancanum* Barrington, an allotetraploid fern endemic to Costa Rica and Panamá, as a test of Hybphaser's ability to detect hybrid species and determine their parentage. Phased haplotypes were used in downstream phylogenetic analyses alongside accessions of species judged to be possible parents from previous phylogenetic work. The resulting measures of locus heterozygosity and allele divergence were consistent with the hybrid status of *P. talamancanum* and the highest proportion of reads phasing unambiguously matched the accessions of its progenitors as hypothesized in previous studies. This outcome corroborates a history comprising hybridization of a *Polystichum* species with tropical North American relationships endemic to southern Central America with a species now endemic to the northern Andes followed by in situ polyploidization. This history requires that the Northern-Andean endemic species previously occurred in southern Central America, a scenario possible given the substantially expanded open-alpine habitat in Central America at the height of the Pleistocene. Overall, we accomplished 2 goals. First, our study corroborates the usefulness of the Hybphaser workflow in resolving hybridization events and accurately identifying parentage in complex reticulate lineages. Second, it demonstrates the power of combining modern genomic techniques with ecological, geographic, and historical data to reconstruct integrated histories of reticulate evolution. This approach holds promise for taxonomic research everywhere, including for species found here in the Northeast.

Sun- 4

Trends in Ground-Nesting Birds and Ground Cover Over 33 Years in Two Adirondack Stands

Brian Merrigan (SUNY ESF, Syracuse, NY) and Stacy McNulty (SUNY ESF, Adirondack Ecological Center, Newcomb, NY)

Abstract - As forests in the Northeast US mature after past harvest and disturbance, it is important to determine the factors influencing bird abundance and to evaluate population trends. Ground-nesting birds may be especially impacted by changes in low-growing vegetation. Many bird species are migratory and rely on northern forests for breeding and nesting, making the quality of these habitats vital for the continuation of their species. We evaluated whether relative abundance of 16 ground-nesting bird species was correlated with plant ground cover in 2 stands: an old-growth and a secondary-growth forest in Huntington Wildlife Forest, Newcomb, NY. We calculated relative abundance of ground-nesting birds in both stands from point-count data collected by Adirondack Ecological Center from 1991 to 2022. Percent ground cover data from the years 2002–2003 and 2021–2022 was estimated at 8-m^2 subplots and shrub/sapling counts were conducted for 4 transects for each songbird plot (n = 49). The overall mean percent cover of the secondary growth forest was 28.99% ± 3.34 SE and 22.63% ± 2.47 SE for 2002–2003 and 2021–2022, respectively. The old-growth stand was 44.05% ± 3.96 SE and 30.66% ± 2.12 SE for 2002–2003 and 2021–2022, respectively. We examined relationships between ground-nesting bird species and ground cover by comparing the presence and abundance of a subset of bird species to specific vegetation types and to the presence of water within the vegetation plots. *Seiurus aurocapilla* (Ovenbird) and *Setophaga caerulescens* (Black-throated Blue Warbler) displayed positive trends in relative abundance in both forest types, beginning around the year 2000. Three other bird species displayed a trend in either 1 or both of the forest types, as well. The relationship between bird abundance and the type and amount of cover, as well as the presence of water in the plot suggests a need to monitor forest understory factors that influence ground-nesting bird abundance on breeding grounds. Future studies utilizing long-term datasets will further our understanding of potential correlations.

Sat- 27

The Root Cure: The Effects of Baicalin on Endometrial Cancer Cells

Skylah Miller (University of Saint Joseph, West Hartford, CT), Anthony Terry (University of Saint Joseph, West Hartford, CT), Chamrouen Chhorn (University of Saint Joseph, West Hartford, CT), Emily Huntley (University of Saint Joseph, West Hartford, CT), and Irene Reed (University of Saint Joseph, West Hartford, CT)

Abstract - Over 65,000 women will be diagnosed with endometrial cancer this year, and over 10,000 will die. Due to a combination of harsh side effects from traditional chemotherapy treatments and the impact of pharmaceutical pollutants on the environment, it is important to identify alternative compounds to treat cancer. *Scutellaria baicalensis* (Chinese Skullcap) contains a chemical that can be concentrated from its roots and has been used in past studies to treat different types of cancer. This chemical, Baicalin, is commonly known as an anti-inflammatory and has been shown to have anti-cancer effects. This study aims to test Bailcalin in 2 types of endometrial cancer cells, Type 1 (Ishikawa) and Type 2 (KLE), to observe impacts on cell growth. Type 1 endometrial cancer is less aggressive, estrogen-responsive, and has a better prognosis compared to Type 2 endometrial cancer. It is hypothesized that the Ishikawa cell line would be more susceptible to the compound due to its less aggressive nature. We tested cell viability by exposing both KLE cells and Ishikawa cells to the compound Baicalin at a drug concentration of a stock solution of (1:50 Baicalin) of 100 mM, 50 mM, and 25 mM. We observed cell viability through an MTT assay and visual observation. The results showed little to no cell viability in the Ishikawa line following Baicalin treatment. On the other hand, the KLE cell line demonstrated a dos-dependent cell-viability response, which is a major step towards treating cancer cells without fully killing the rest. Future directions include determining if Baicalin can be effectively used to treat endometrial cancer and learning more about the efficacy of the drug at different concentrations as well as any impacts the drug might have on non-cancerous cells.

Sun- 1

How Does Climate Change Alter Invasion Risk of Invasive Species in the Northeast US?

Abigail Minnekine (SUNY Geneseo, Geneseo, NY) and Suann Yang (SUNY Geneseo, Geneseo, NY)

Abstract - Invasive species are one of the greatest threats to biodiversity. As climate change is causing the earth to become warmer, invasive species will spread into new environments that were previously unsuitable. These altered species distributions are expected to lead to new significant impacts in the future for invasive species. In this study, we focused on invasive species that are of high priority for the Northeast region of the United States to determine their invasion risk to new regions. Invasion risk is the likelihood that a nonnative species will invade an area due to the location's suitability for the species. To analyze the changing distributions, and therefore invasion risk, for these species, we first obtained occurrence records from the open-source database Global Biodiversity Information Facility (GBIF) for each species. We then used the R-based graphical user interface Wallace Ecological Modeling Application to produce species distribution models (SDMs) for the current range and the predicted ranges (2050 and 2070) of the species based on projected climatic variables. Next, we used both the open-source geographic information system QGIS and the R programming environment to manipulate raster (GeoTiff) files to analyze the amount of geographic area within the United States region of North America where the species will be present for the different SDMs. Our preliminary results reveal that the distribution of high-risk invasive species in the Northeast US varies in their response to climate change. We found that some species distributions maintain their area and shift northward while others increase their range in the Northeast and expand north and westward, possibly due to their life-history traits and the species they co-occur with. Our findings have implications for the development of sustainable management strategies for invasion risk.

Sat- 12

Host Preferences of *Nasonia vitripennis* Parasitoid Wasps

Brandon J. Minogue (SUNY Plattsburgh, Plattsburgh, NY) and Alyssa Gleichsner (SUNY Plattsburgh, Plattsburgh, NY)

Abstract - *Nasonia* parasitoid wasps are used as a bio-control agent against pest flies, such as Sarcophagidaes (flesh flies), that impact agriculture. Our pilot study examined if the *Nasonia* wasps exhibited a preference in pupae size when choosing a host. *Nasonia* wasps were given a choice between pupae size of *Sarcophaga* sp. fly pupae to select as a host. At the end of the experiment, we totaled and sexed the offspring. We found no statistical differences in host-size preference across treatments, but lacked statistical power to infer similarity. New research, with higher sample sizes and an additional examination into whether light availability impacts host choice will be discussed.

Sun- 44

Gregarious and Above Ground Behavior in the Blue-spotted Salamander Complex

Thia Moore (St. Lawrence University, Canton, NY), **Rayna Bidwell** (St. Lawrence University, Canton, NY), **Julia Sirois** (St. Lawrence University, Canton, NY), Kristine Hoffmann (St. Lawrence University, Canton, NY), and Sara L. Ashpole (St. Lawrence University, Canton, NY)

Abstract - *Ambystoma laterale x jeffersonianum* (Blue-spotted Salamander complex) is found throughout the northeastern US. Blue-spotted and unisexual salamanders are cold tolerant, terrestrial, and generally understood to be insectivores that hunt beneath leaf litter or underground in burrows. Between October and November 2022, we documented 106 sightings of salamanders in the Blue-spotted complex. We studied the possibility of gregarious surface behavior. All salamanders were found active, above the leaf litter. We used transects, GIS, and GPS to measure the proximity of individuals in a 10-m radius. 106 complex salamanders were sighted within 22 transects. We recorded instances of perching behavior (n = 14), which has not yet been reported for this complex. When a salamander was seen perched on top of vegetation or objects (branches, tree trunks, rocks), we recorded its height from the ground. We found that 57.5% of the salamanders were within 2.6 m of each other (near) and 11% were within 1.1 m (close proximity). Our next steps involve looking at DNA and measurements such as SVL and weight to determine if the gregarious or climbing behaviors correspond with biotype. Further research is needed to determine the role of intraspecific gregariousness and perching behaviors.

Sun- 25

Linking Arrival of Autumn, the Disappearance of Fruit, and the Anthropause

Joshua H. Ness (Skidmore College, Saratoga Springs, NY)

Abstract - Many plants present fruits at a time that coincides with the falling temperatures of autumn and associated avian migrations. Although these plant-provided resources can be an important nutritional asset during that period, plants diverge in the degree to which they are utilized by avian populations (both migrant and resident) as well as other wildlife. Variation in plant–animal interactions can be further influenced by the noises and physical disturbances associated with human activity. For example, the "Anthropause" is an appellation for the decrease in human activity and its associated influences on nature associated with the onset of COVID-19 pandemic in 2020. This work contrasts among-year variation in fruit removal from plants in a forest in Saratoga Springs, NY, in a fashion that incorporates among-year variation in temperature regime, and explores whether the timing or rate of fruit loss diverged in 2020 relative to other years (earlier and subsequent). Three findings are highlighted. First, the median dates of fruit removal and pace of removal are contrasted for 21 species. Second, among-year variation in autumn temperatures did not have a consistent effect on the median date of fruit crop removal across the 14 species studied in >1 year. Rather, the 8 species whose removal was delayed in warmer years were characteristically "early" species, and the 6 species whose removal was advanced in warmer years were characteristically "late" species (mean ± SE for julian date of removal midpoints for delayed vs. advanced = 277.1 ± 7.5 and 301.4 ± 10.8, respectively). As a result, among-species differences in this New York forest are more pronounced in years with colder autumns and more muted in years with warmer autumns. Third, across 8 species the timing and pace of fruit removal in autumn 2020 was not consistently advanced or delayed or faster or slower than other years (2007, 2010, 2018, 2019, 2021, 2022). However, the residual variation not explained by temperature was greater in 2020 than in other years. That is, descriptive models largely informed from data collected in years with conventional anthropogenic forcing did a poorer job of predicting fruit removal dynamics for a given plant species in 2020 relative to how well they predict other years.

Sat- 28

Using Machine-Learning Models to Identify Crown Class Condition of EAB-Infested Forests

George Ni (University of Vermont, Burlington, VT), Nicholas Gotelli (University of Vermont, Burlington, VT), and Jian Duan (USDA-ARS BIIRU, Newark, DE)

Abstract - As an increasing number of invasive insect pests are introduced to landscapes due to global trade transport and geographic range shifts, there is a greater need for research and study on alternative methods of control beyond insecticides and pesticides. A classical biocontrol program was developed and implemented by the US Department of Agriculture against the invasive beetle *Agrilus planipennis* (Emerald Ash Borer [EAB]) after first detection in the US in 2002. The EAB biocontrol program has released several introduced parasitoid wasps as biocontrol agents across 32 EAB-infested states. While recent field studies have observed the successful establishment of these agents and significant EAB suppression in release sites, the contribution of this EAB biocontrol program to ash recovery and regrowth is currently not known. This project assesses the ecological impacts of the current EAB biocontrol program on ash tree survival and crown class recovery in North America. This study will establish whether machine learning (ML) models and drone photography can serve as a new fieldwork methodology to identify crown class conditions and forest canopy cover in EAB-infested forests, and whether the crown class conditions of EAB-infested forests are recovering over time given biocontrol deployment. We have trained a suite of machine-learning models on drone imagery of EAB-infested natural areas collected in the summer of 2022 in the New England Region and will ground truth the sites by field transect surveys collected at the same time. Current benchmarks show that the models can adjust their weights and predictions for crown class to result in 75% validation dataset accuracy. These results support the hypothesis that machine learning models are able to learn structural components of forest crown class conditions and can learn to predict them. This study suggests that ML models can be compared to current field methodologies used to detect EAB damage in native ash forests, and with increased data and high-resolution imagery, ML can assess both the impact that the EAB has on native ash trees as well as the impact biocontrol agents have on both the EAB and native ash forests after deployment.

Sun- 6

Bird Eyes: Specialized or Generalized?

Connor Nielsen (SUNY Plattsburgh, Plattsburgh, NY) and Luke P. Tyrrell (SUNY Plattsburgh, Plattsburgh, NY)

Abstract - There is enormous variation across the animal kingdom, both in the diversity of traits that different species possess and the fitness-related tasks those traits have evolved to accomplish. Visual systems are no exception. Much of the published literature on animal visual systems highlights species with specialized lifestyles and how their visual systems are uniquely organized towards some specialized task. In birds, for example, raptors and swallows share a similar, visually demanding predation task and both have evolved a bifoveate retina to give them excellent spatial acuity both frontally and laterally. But flycatchers have a different predation task and so have evolved an additional photoreceptor to see in slow-motion and with high contrast sensitivity. Here, we studied visual spatial resolving power—using retinal wholemounts—and visual field parameters—using the ophthalmoscopic reflex technique—in 6 songbird species to determine whether their visual systems are specialized to the same foraging pressures that have shaped other aspects of their morphology. *Cardinalis cardinalis* (Northern Cardinal), *Passerina cyanea* (Indigo Bunting), *Agelaius phoeniceus* (Red-winged Blackbird), and *Quiscalus quiscula* (Common Grackle) all share a similar annual foraging pattern, where they forage on seeds and vegetative matter in the winter but switch to arthropods in the summer. However, cardinals and buntings have classic seed-eating beaks, whereas blackbirds and grackles have classic insectivore beaks. The generally excepted implication is that seed-eating season is the important fitness season for cardinals and buntings, but insect-eating season is more important for blackbirds and grackles. Therefore, we predicted the visual systems to also be organized for the most important season. We also compared them to 2 species that eat insects year-round (*Toxostoma rufum* and *Dumetella carolinensis*) and to previously published studies on other species. We found that there may be a general songbird visual configuration, which is underrepresented in the literature but also highlights the strength of the selective pressure on species with unique visual systems (e.g., swallows, flycatchers).

Sun- 49

Effects of Diet on Mealworms Raised for Aquaculture Feed

Ethan K. Nurick (Vassar College, Poughkeepsie, NY), Timothy Lampasona (Vassar College, Poughkeepsie, NY), and Lynn Chirstenson (Vassar College, Poughkeepsie, NY)

Abstract – Insect-based proteins have recently emerged as a promising alternative ingredient for aquaculture feeds. The protein density and fatty acid profile of insect-based proteins is much closer to the industry standard marine ingredients (fishmeal and fish oil) than other emerging alternatives, like soy protein concentrate. Additionally, insect proteins are more sustainable and less resource intensive to produce than marine ingredients and plant-based proteins. They require less water, less arable land, and present opportunities for the valorization of waste products. *Tenebrio molitor* (Yellow Mealworm) is one of the premier species for use as animal feed because of their relatively high density of crude protein (50–70%) and unusual ability to valorize plastic waste. We tested how crude protein and fatty acid content varied in *T. molitor* between 4 different treatment feeds: vegetable food waste, PLA plastic, a mix of food waste and plastic, and wheat bran. We evalutated the resulting mealworm-based protein based on the number of harvestable larvae, the mass accumulated by the larvae over the treatment period, as well as their crude protein and fatty acid content. These metrics were compared to that of grower-standard marine ingredients and soy-concentrate proteins to ultimately determine their viability as an alternative ingredient for aquaculture feeds.

Sat- 14

Teaching Scientific Literacy to Undergraduates Through a Long-term Research Project on Stream Macroinvertebrates

Alison Nurok (Middlebury College, Middlebury, VT) and **Carolyn Dash** (Middlebury College, Middlebury, VT)

Abstract - Undergraduate research experiences are a valuable tool in biology education. Course-based research projects provide both a framework for teaching biology concepts and science literacy skills and an experiential learning opportunity for students. By creating meaningful research opportunities in the introductory biology lab courses, we make biology research more accessible to all students. Students in our introductory biology course collect and contribute data to our long-term stream macroinvertebrate field study in the Middlebury and New Haven rivers, VT. In this study, students explore resistance and resilience of aquatic insect communities to flooding disturbances in local streams. Following this field research experience, students analyze the data using statistics, communicate the results using graphs and formal scientific writing, and participate in the review process. This research project is one of 3 that students participate in during the semester. Through these projects we provide scaffolding that enables students to develop scientific literacy skills that form the foundation for our biology department's curriculum.

Sat- 55

Effect of Land Use on Soil Organic Carbon, and Inorganic Nitrogen and Phosphorus

Jillian O'Rourke (Purchase College, SUNY) and George P. Kraemer (Purchase College, SUNY, Purchase, NY)

Abstract - Anthropogenic disturbances alter ecosystems and pose long-term dangers to the provision of ecosystem services. We hypothesized that land-use/land-cover (LULC) change influences soil health. To evaluate the hypothesis, our study measured the soil organic carbon (OC) via loss on combustion, concentration of water-soluble nitrogen (N; LaMotte Nitrate-Nitrogen test kit), and water soluble phosphorous (P; Hach phosphate test kit) in the top 8 cm soil. The soil type (Ridgebury Complex) was constant at all sites we examined on the Purchase College's campus. LULC types were manicured lawn (L), partially maintained area (PM), and forest fragment (FF). Soil organic content was significantly different ($P < 0.005$) among LULCs, with FF > PM > L. Results indicated a significant influence of LULC on nitrogen and phosphorous levels, with (PM = FF) > L for N and L > (PM = FF) for P. N and P levels were not significantly correlated ($P > 0.05$), though the power of the test was relatively low. Previous studies demonstrated that a shift in LULC from manicured/maintained grass into unmaintained forests increases soil nutrient levels. Other studies have also suggested that anthropogenic land use results in a reduction in OC storage, indicating a potential strategy for limiting the factors leading to climate change. Our study clearly demonstrated that land-use/land-cover changes alter carbon storage and nutrient levels.

Sat- 7

Amphibian Moving Patterns With and Without a Drift Fence

Samantha Oaks (SUNY Cobleskill, Cobleskill, NY), Jessica Furlong (SUNY Cobleskill, Cobleskill, NY), and Andrew Gascho Landis (SUNY Cobleskill, Cobleskill, NY)

Abstract - Amphibians are often seen as prey for fish, but young fish end up also being prey to tadpoles and adult amphibians, which is problematic for reestablishing a wild population of fish born in hatcheries. A drift fence had been proposed to keep amphibians from breeding in a selected pond. The purpose of this project was to see if a drift fence would be successful at keeping amphibians out. We initiated this study in the spring by counting different species of egg clusters present in 2 different ponds: one with a drift fence present (experimental) and the other without (control). Part of the metamorphosis and breeding seasons for frogs took place in the summer. In the fall semester, we collected the tadpole data. We found that the control pond generally had a higher population of amphibian eggs than in the experimental pond. However, the two-tailed *t*-tests did not show a statistical difference between them. This egg data was only significant on April 4, just after holes in the drift fence and broken posts were fixed ($P < 0.03$). In the fall, there were tadpole catch per unit effort (CPUE) statistical differences between the control and experimental ponds using a two-tailed *t*-test. Since tadpoles are not stationary like egg clusters, they had to be trapped to be counted. We used double-funnel traps that were baited with a combination of pelleted fish feed and chunks of bread. The tadpole-trapping data was significant on 10 September ($P < 0.02$) and 13 September ($P < 0.02$). A drift fence is a novel approach to keeping out amphibians, which made it difficult to find research as a comparison. The damage to the drift fence throughout the winter before my experiment may have impacted results. The start date of this experiment may not have captured amphibians coming out earlier in the year, which might be a factor because amphibians may be completing their life cycles faster than previously documented, due to climate change.

Sat- 39

Importance of Wildflower Patches and Ornamental Gardens for Small-scale Agriculture in Northern NY

Aswini Pai (St. Lawrence University, Canton, NY), Samantha Haab, (St. Lawrence University, Canton, NY), and Raven Larcom (St. Lawrence University, Canton, NY)

Abstract - Wild bee species are ecologically and economically valuable as pollinators that enhance biodiversity in both large-scale commercial agriculture and in small-scale kitchen gardens. With the current threats to native bee populations, there is a pressing need for more scientific research to monitor wild bee communities. Our research focused on the importance of wildflower patches as well as ornamental gardens as resources and attractants to wild bee species that also pollinate kitchen gardens in St. Lawrence County. We hypothesized that the wild bee diversity would be the greatest in areas with greater floristic diversity, at the point in the summer when the most plants had flowered, and that there would be no significant difference among bee species found in cultivated kitchen gardens and those found in nearby wildflower patches and ornamental gardens. We sampled bee species richness and floral resources in kitchen gardens, adjacent wildflower patches, and nearby ornamental gardens using pan trapping during the summer. We trapped 20 genera and at least 100 species of wild bees. We found no significant difference ($P > 0.05$) in the bee species trapped both within and outside of kitchen gardens. However, we found that native wild bee abundance is positively correlated to with flowering plant species richness ($P > 0.05$). Both wildflower patches and ornamental gardens can provide critical supplemental resources for wild bees throughout the summers, thus supporting pollination services for local crops by serving as attractants. However, there is a pattern indicating the importance of floristic diversity both within and outside a kitchen garden for attracting wild bees. This study contributes to the much-needed compilation of scientific baseline information concerning plant–pollinator interactions and monitoring in agroecosystems in St. Lawrence County. The study also has ramifications for the gardening of native species.

Sun- 46

A Kid-friendly Neighborhood: A Comparison of Herring Gull Fledging Success Across Habitats on GDI

Asher Panikian (College of the Atlantic, Bar Harbor, ME), Jennifer McNamara (College of the Atlantic, Bar Harbor, ME), Hannah Gower-Fox (College of the Atlantic, Bar Harbor, ME), and Wriley Hodge (College of the Atlantic, Bar Harbor, ME)

Abstract - Great Duck Island (GDI), located 19 km offshore in the Gulf of Maine, is home to a colony of *Larus argentatus* (Herring Gull) that has been monitored for the past 24 years. Herring Gulls are declining around the western North Atlantic. However, the population on GDI appears to be stable, making it an important place to monitor nesting gulls. The focus of our study was a sample of 53 nests from the southern end of the island, which has ~700 nests. We studied the influence of different habitat types on fledging success and growth curves of Herring Gull chicks. We subdivided nesting habitat into 3 strata: low vegetation, high vegetation, and rocky shoreline. Using stratified random sampling, we selected nests from each habitat for daily monitoring of chick morphometrics and condition. Our data suggests that for this season birds in all 3 habitats either did well, fledging 2 or 3 chicks, or failed entirely.

Sat- 34

Demography and Parasitism of Eastern Painted Turtles from a Connecticut Farm Pond

Antonios Pappantoniou (Housatonic Community College, Bridgeport, CT)

Abstract - Demography and parasitism of *Chrysemys picta* (Painted Turtle) from a Connecticut farm pond has been the subject of a project started in 2010 as an introduction to fieldwork for Housatonic Community College biology majors that has continued since that time. We collected Painted Turtles using hoop nets that were 91 cm (36 in) in diameter and baited and set for 24-hour intervals. Individual turtles were measured, weighed, had their sex determined, marked for later identification, and returned to the pond. In addition, we examined each turtle for the presence of leeches, which we counted and recorded their distribution on the turtle. Results of the study showed that female Painted Turtles achieved an average carapace length of 138.3 mm, and an average weight of 333.9 g. Males were smaller, with an average carapace length of 123.5 mm and an average weight of 264.1 g. The male: female ratio was 0.98:1. We used trap data to determine catch per unit effort (CPUE). The CPUE averaged 3.83 over the study period. *Placobdella parasitica* (Smooth Turtle Leech) was the only leech found on the turtles. Female turtles were more frequently parasitized than were males (65.2% males, 70.3% females). These data agree with similar studies of the Painted Turtle.

Sat- 43

Insect Biodiversity Amongst Native and Nonnative Plants in Teatown Lake Reservation, Ossining, NY

Kristen Pareti (Purchase College, SUNY, Purchase, NY) and Allyson Jackson (Purchase College, SUNY, Purchase, NY)

Abstract - Through human development, global trade, and travel, plant species have been distributed to novel environments. Some of these species can outcompete native plants and aggressively take over ecosystems. Vegetation acts as an important foundational ecosystem service to the higher trophic levels through habitat and food resources. It is important to understand how changes in plant species can reverberate throughout the food chain. This study assesses possible differences in biodiversity in the invertebrate insect populations found on native and nonnative plants. We studied 2 locations on Teatown Lake Reservation in Westchester County, NY. We collected insect samples from 10 transects per site via sweep net collection in July, August, and September (total $n = 60$). We identified the insect species and calculated Shannon diversity and family level richness. We identified plants to species level at every meter of the transect, from 0 to 5 m. We categorized transects based on the overall percentage of native species present. There were minimal differences between insect biodiversity of native plants versus nonnative plants. These preliminary results could shed light on insect population's ability to adapt to nonnative plants.

Sat- 15

From Lake to Sea: The Wintering Habitat Preferences of the Common Loon

Autumn L. Pauly (College of the Atlantic, Bar Harbor, ME)

Abstract - *Gavia immer* (Common Loons) have been used as an indicator species for water quality and various environmental conditions, particularly on freshwater lakes. There have been extensive studies on the summer breeding grounds of this species, but less is known about their wintering behavior, though this can be used as elements of assessing the health of wintering habitats. I conducted biweekly observations at 10 coastal sites on Mount Desert Island (Hancock County, ME) to determine the habitat preferences of Common Loons during their wintering season. My research is a continuation of prior studies conducted in 2010. I recorded the approximate coordinates of the individuals present at the site and a brief description of their behavior. I also recorded the presence of other species of birds during each observation period. Data collected included spatial weather data, tide variations and percentages, water and wave conditions, environmental shelter gradient, moon phases, the degree of human presence, and a brief description of the weather and conditions present at each site. I compared my spatial data to the data previously collected by Jacoby to examine possible site fidelity and variation in spatial patterns. Additionally, I cross-referenced my spatial data to local geological and environmental maps to identify correlations between Common Loon abundance and freshwater inputs, bathymetric variation, and geological composition, among others. Common Loons prefer sheltered, accessible coastlines, and the likelihood of observation is not affected by general weather conditions or human presence; in fact, loons were more likely to be seen in areas with more human presence. Sections of coastline that were exposed to inhospitable weather conditions or were otherwise covered in ice showed a reduction in loon presence. Further examination into the food availability within preferred winter habitats may reveal how we can use this species as an indicator species during its wintering season.

Sat- 30

The Bigger, the Better? Comparative Recapture and Growth Rates in Headstarted Blanding's Turtles

Regina Peters (University of Massachusetts Lowell, Lowell, MA), Alison Hamilton (University of Massachusetts Lowell, Lowell, MA), Stephanie Koch (US Fish and Wildlife Service, Sudbury, MA), Bryan Windmiller (Zoo New England, Acton, MA), and Cara McElroy (Zoo New England, Acton, MA)

Abstract - We conducted a size-based comparison of recaptured *Emydoidea blandingii* (Blanding's Turtle) to evaluate the long-term effect of release size on headstarted individuals. From 2007 to 2021, a total of nearly 3000 hatchling and juvenile Blanding's Turtles were released between 2 eastern Massachusetts sites. The studied turtles varied from direct-released hatchlings weighing an average of 9.3 g to headstarted yearlings weighing up to 490.7 g at release. Our research evaluated both recapture rates and post-release growth in relation to release-size class at each site. The results showed that headstarts of moderate size (50–150 g at release) had the highest recapture rates at both sites, and headstarts consistently weighed more than direct-released hatchlings for 14 years following release. Our results suggest that managers should target a release size of at least 50 g when headstarting Blanding's Turtles.

Sat- 42

Overwintering Site Selection of *Nicrophorus orbicollis* Say in New York

John A. Pipino (SUNY Oneonta, Oneonta, NY), Elizabeth Bastiaans (SUNY Oneonta, Oneonta, NY), Brandon Quinby (SUNY Cobleskill, Cobleskill, NY), and Carmen Greenwood (SUNY Cobleskill, Cobleskill, NY)

Abstract - We consider overwintering site selection a factor that will affect the post-release viability of the endangered *Nicrophorus americanus* (American Burying Beetle) relocated from Block Island, RI, to New York. Through use of the congener most closely related to American Burying Beetle, *Nicrophorus orbicollis* (Roundneck Sexton Beetle), we conducted a laboratory olfactometer study comparing 2 populations of the surrogate species aimed to detect significant differences in frequency of choice between them when acclimated to overwintering conditions. When presented with 4 choices: leaf litter from a mixed hardwood forest, forest soil, *Peromyscus* species nesting material, and a blank control, we found there is no significant evidence that there is a difference in choice between a population of Roundneck Sexton Beetle indigenous to NY and a population from Block Island, RI. These results may suggest that the conservation of current overwintering habitats in New York are more appropriate than the development of habitat related to that of Block Island, RI.

Sat- 19

Comparing Exurban and Rural Wildlife Activity in a Diverse Carnivore Community

Mairi K. P. Poisson (University of New Hampshire, Durham, NH), Andrew R. Butler (University of New Hampshire, Durham, NH), Patrick Tate (New Hampshire Fish and Game Department, New Hampton, NH), Daniel H. Bergeron (New Hampshire Fish and Game Department, New Hampton, NH), and Remington J. Moll (University of New Hampshire, Durham, NH)

Abstract - Urbanization and related habitat fragmentation can disrupt wildlife behavior and lead to declines in biodiversity and ecosystem function. The northeastern United States is a patchwork of heavily developed urban centers mixed with rural and forested areas. This region serves as a bellwether for the ongoing expansion of human development into more rural areas of the country, and as such acts as a useful model system to evaluate how wildlife respond to exurban sprawl. We studied the impacts of urbanization, measured as proportion impervious surface cover, on the activity patterns of 6 mammalian carnivore species in southeastern New Hampshire: *Canis latrans* (Coyote), *Lynx rufus* (Bobcat), *Mephitis mephitis* (Eastern Striped Skunk), *Pekania pennanti* (Fisher), *Procyon lotor* (North American Raccoon), and *Vulpes vulpes* (Red Fox). We deployed an array of 104 cameras situated in exurban (n = 48) and rural (n = 56) areas during summer 2021. We analyzed camera-trap detections of our focal species to compare activity levels (overall proportion of the day a species was active) and activity patterns (variation in activity across diel periods) between rural and exurban areas. The activity levels of Bobcats differed significantly ($P < 0.05$) between rural and exurban sites, showing higher activity levels in rural areas. In contrast, there was no statistical significance in the differences between activity levels for any of the other focal species. Th activity patterns of Bobcats, Fishers, and Red Foxes differed significantly between rural and exurban sites (all P-values < 0.05), while Coyotes, Eastern Striped Skunks, and Raccoons exhibited no significant difference between sites. These results suggest that wildlife alter activity as an adaptation to exurban development and that such adaptations are species-specific. Further, this work indicates that some species adapt by changing their level of activity while others maintain activity levels but change activity patterns. Overall, this study sheds light on the complex behavioral adaptations that some carnivores make in response to urbanization and the potential consequences thereof for mammal communities.

Sun- 17

Asian Shore Crab Success Relating To Prey Availability

Eva Rando (Bridgewater State University, Bridgewater, MA), **Franchesca Rolon** (Bridgewater State University, Bridgewater, MA), Nick Loonie (Bridgewater State University, Bridgewater, MA), and Christopher P. Bloch (Bridgewater State University, Bridgewater, MA)

Abstract - *Hemigrapsus sanguineus* (Asian Shore Crab) is native to the Pacific Ocean but has become an invasive species on the Atlantic coast of North America. Its abundance grew rapidly after its introduction in the 1980s, such that it is now the most abundant brachyuran crab in rocky intertidal habitats throughout most of New England. Recent evidence, however, suggests that its population may be equilibrating or declining at some sites in southern New England and the Mid-Atlantic. There are many possible causes for such patterns of population dynamics. For example, the Asian Shore Crab is a voracious predator that depletes abundances of its most favored prey (e.g., bivalves). Depletion of the most energetically profitable prey may lead to reduced energetic condition and, thereby, reduced growth and fecundity. We investigated body size distributions of the Asian Shore Crab and prominent prey species and competitors (*Carcinus maenas* [Green Crab], *Mytilus edulis* [Blue Mussel], and *Littorina littorea* [Common Periwinkle]) using plot samples collected over 9 years at 12 sites in Massachusetts and Rhode Island. Mean body size of the Asian Shore Crab generally increased over time, although this pattern varied among sites. This may reflect reduced recruitment of juveniles over time, consistent with the hypothesis that depletion of energetically profitable prey leads to reduced fecundity. Further study of the reproductive biology of the Asian Shore Crab relative to the abundance of its preferred prey may help clarify this pattern.

Sun- 52

Habitat Assessment for River Herring in the Acushnet River

Caroline T.A. Reusch (Bridgewater State University, Bridgewater, MA), John Sheppard (Massachusetts Division of Marine Fisheries, Boston, MA), and Steve Block (NOAA Restoration Center, Beverly, MA)

Abstract - River herring (the collective name for *Alosa pseudoharengus* [Alewife] and *A. aestivalis* [Blueback Herring]) are native, anadromous fish that migrate each spring to spawn in coastal watersheds that have suitable freshwater habitat for egg incubation and juvenile rearing. The Massachusetts Division of Marine Fisheries (DMF) conducts assessments of river herring spawning and nursery habitat that assist habitat and population restoration efforts and contribute to Massachusetts Department of Environmental Protection (MassDEP) water-quality assessments. The Acushnet River watershed has been the focus of much diadromous fish restoration in recent years. The primary spawning habitat for river herring in this system, the lower and upper New Bedford Reservoir in Acushnet, MA, was assessed in 2019–2020. The habitat assessment identified both water quality and habitat impairments. The lower and upper basins were classified as impaired for exceedances in dissolved oxygen (DO), pH, Secchi disk, total nitrogen (TN) and total phosphorous (TP) based on MassDEP's habitat assessment criteria. Widespread abundance of invasive *Cabomba caroliniana* (Fanwort) and *Myriophyllum heterophyllum* (Variable-leaf Milfoil) along with agricultural practices in the surrounding area contribute to the eutrophication and expansive anoxic hypolimnion in both basins. Additionally, classifications for fish passage and stream flow in the lower reservoir were deemed impaired due to unsuitable conditions at various locations throughout the watershed. The impairments identified in this assessment appear to be impacting river herring population recruitment and are limiting production in this system. We will discuss recommendations for future restoration actions.

Sun- 30

Effects of Forest Structure and Large-Tree Retention on Bats in the Adirondacks

Julia Rizzo (SUNY ESF, Syracuse, NY), Vanessa Rojas (SUNY ESF Ranger School, Wanakena, NY), Gregory McGee (SUNY ESF, Syracuse, NY), and Stacy McNulty (SUNY ESF Adirondack Ecological Center, Newcomb, NY)

Abstract - Bats are important to northeastern forest ecosystems, and their conservation is critical. However, bat populations have declined due to white-nose syndrome and habitat degradation. Recovery of bat species can be facilitated by understanding how forest management relates to summer roosting and foraging success. Our study documented bat habitat use relative to forest management and tree-related microhabitats (TReMs) used for roosting in the central Adirondack region of New York. Study areas included a 50-ha irregular shelterwood where select large trees (>45 cm dbh) were retained with understory sapling removal, a 25-ha commercial shelterwood, and a 50-ha unmanaged control. We deployed ultrasonic detectors for ≥14 nights per summer during each of 2021 and 2022. We rotated 7 detectors between 7 sites in the irregular shelterwood, 6 sites in the commercial shelterwood, and 7 sites in the control. We collected vegetation data using fixed-radius plots. We identified echolocation calls and sorted them into high-, mid-, and low-frequency phonic groups. The high-frequency group includes all *Myotis* species (*Myotis lucifugus* [Little Brown Bat], *Myotis sodalis* [Indiana Bat], *Myotis septentrionalis* [Northern Long-eared Bat], and *Myotis leibii* [Small-footed Bat]), the mid-frequency group includes *Lasiurus borealis* (Eastern Red Bat) and *Perimyotis subflavus* (Tri-colored Bat), and the low-frequency group includes *Eptesicus fuscus* (Big Brown Bat), *Lasionycteris noctivagans* (Silver-haired Bat), and *Lasiurus cinereus* (Hoary Bat). We used generalized linear mixed models, occupancy modeling, and Akaike's information criterion (AIC) to identify relationships between bat habitat use, forest structural characteristics, and temporal variables affecting detection. Mean basal area (managed: 12.7 m^2/ha, unmanaged: 33.5 m^2/ha), canopy cover (managed: 11%, unmanaged: 90%), and sapling density (managed: 1397.3 saplings/ha, unmanaged: 3657.1 saplings/ha) were significantly different between managed and unmanaged sites ($P < 0.001$). There was a significant difference in average basal area ($P < 0.05$) between the commercial and irregular shelterwood sites, but no differences in TReM variables. Sapling density, basal area, and canopy cover were informative variables in predicting bat habitat use; other models including snag density and exfoliating bark were not informative. TReM density was not informative in predicting bat habitat use. Additional studies using both roosting and foraging data are needed to further evaluate the effect of large-tree retention on bat habitat use.

Sat- 46

Camera-Trap Monitoring of Recreation and Wildlife Patterns on a Multi-use Trail Network

Sara Rose-McCandlish (Vassar College, Poughkeepsie NY), Lynn Christenson (Vassar College, Poughkeepsie, NY), Stephen Kovari (Vassar College, Poughkeepsie, NY), Jeff Lougee (The Nature Conservancy, North Conway, NH), and Sarah Garlick (Hubbard Brook Research Foundation, Woodstock, NH)

Abstract - With the increasing popularity of outdoor recreation, it is crucial to understand the impacts of these activities on wildlife movement patterns and behavior. Furthermore, specifically studying the effects of recreation type, time, and frequency on wildlife presence is advantageous for focusing conservation efforts. To observe these patterns between recreation and wildlife, we used camera-trap monitoring on a multi-use trail network at the Green Hills Preserve in North Conway, NY. This preserve in the White Mountains includes hardwood forests and wetlands and allows hiking, mountain biking, snowshoeing, and skiing. The benefits of camera-trap monitoring include being noninvasive and efficient for extended observations. We placed 10 cameras on trails of varying popularity and 1 camera off trail. Preliminary results support the habitation of many species, including *Odocoileus virginianus* (White-tailed Deer), *Canis latrans* (Coyote), *Ursus americanus* (American Black Bear), *Meleagris gallopavo* (Eastern Wild Turkey), *Procyon lotor* (Common Raccoon), and *Alces alces* (Moose). Many wildlife individuals showed consistent movement patterns across the study time period. Additionally, there was evidence of wide variability in human frequencies for different trails, seasons, and times of day. Furthermore, a negative correlation between human and wildlife frequency is supported by preliminary evidence. This association was observed between trails with high and low levels of human frequency and seasonally. These preliminary results of a negative association between human and wildlife presence will be important for the landowner, The Nature Conservancy, to consider amidst community pressure to expand the trail network on the preserve. Moreover, the consistent movements of many wildlife individuals could be interrupted if human presence increases on historically low-use trails and current off-trail areas. Further analysis of associations between specific recreation types and wildlife presence could aid in balancing growing needs for preserve access and wildlife-conservation efforts.

Sat- 50

Effects of Winter Temperature on Abundance of Asian Shore Crabs in Southern New England

Matt Santos (Bridgewater State University, Bridgewater, MA), **Cory Partida** (Bridgewater State University, Bridgewater, MA), and Christopher P. Bloch (Bridgewater State University, Bridgewater, MA)

Abstract - *Hemigrapsus sanguineus* (Asian Shore Crab) is an invasive predator that was initially discovered in New Jersey in 1988 has now spread across much of the Atlantic coast of North America. It is currently the most abundant brachyuran in rocky intertidal zones in most of New England and the Mid-Atlantic. At a rocky intertidal habitat in Sandwich, MA, abundance of the Asian Shore Crab grew steadily from 2003 to 2012, but abundances sharply declined from 2012 to 2015. No steady increase has been observed in subsequent sampling years. These findings suggest that the Asian Shore Crab is experiencing boom–bust dynamics, in which an invasive species initially grows rapidly in population size but then experiences a sharp decline and stabilization. One possible mechanism driving boom–bust dynamics is changes in average water temperatures. We correlated abundance data at Town Neck Beach in Sandwich, MA, from 2003 to 2020 and abundance data from 11 other field sites in southern New England from 2014 to 2020 with air temperatures collected from 6 weather stations within a 24-km radius of field sites. Our results illustrate that there was no significant correlation between Asian Shore Crab abundances across all field sites with the number of days during the winter season at or below -10 °C and -5 °C. However, a non-significant correlation between mean densities and number of days below -15 °C at Town Neck Beach approached significance ($P = 0.054$). This non-significant correlation illustrates a possible effect of extreme winter temperatures at this field sites and warrants further data collection. Less frequent temperature extremes due to climate change could diminish the effect of winter declines and allow greater population growth of the Asian Shore Crab.

Sun- 53

Geospatial and Temporal Variation of Vertebrate and Invertebrate Scavenger Densities in Eastern Massachusetts

Samantha J. Sawyer (Curry College, Milton, MA), Amelia Beauregard (Curry College, Milton, MA), Dani Borrasso (Curry College, Milton, MA), Brittany Bailey (Curry College, MA), Caitlin O'Reilly (Curry College, Milton, MA), Lily Turner-Burrell (Curry College, Milton, MA), Hailey Gonsalves (Curry College, Milton MA), Sarah Channen (Curry College, Milton, MA), William Noyes (Curry College, Milton, MA), and Elizabeth Wade (Curry College, Milton, MA)

Abstract - Scavengers are integral to the nutrient cycling of animal remains in ecosystems. Scavengers are categorized into invertebrate and vertebrate groups, each serving different roles in the movement of carrion nutrients throughout the food web. Specifically, vertebrate consumption of carrion integrates nutrients into upper trophic levels and only becomes available to plants through animal waste. Invertebrate animals integrate nutrients into lower trophic levels through interactions with microbial communities and through consumption by insectivores. Therefore, understanding the biology and life histories of scavengers aid in understanding competitive interactions across groups for carrion resources, which influences who ultimately consumes these remains and nutrient flow. Studies have shown seasonal variation in scavenging influences carrion fate, but these studies are often conducted in southern regions of the United States. The goal of this study is to understand geospatial and temporal variation in scavenger densities for future study on carrion fate in the Northeast region. Curry College exists adjacent to the Blue Hills Reservation, a 2833-ha (7000-ac) protected state park located 11 km southwest of downtown Boston, MA. Curry College is divided by wetland with wooded habitat surrounding the southernmost side of campus, serving as a refuge for wildlife populations migrating to and from the Blue Hills. We have placed 24 unbated game cameras ~50 m from each other around the wood habitat of the Curry College campus. We have monitored wildlife densities since October 2022, using digiKam to identify species in photos using metadata tags. Similarly, we have monitored invertebrate scavengers using baited hanging traps placed ~1.5 m (~5 ft) off the ground. We hung traps at 5 cameras at a time with at least ~100 m between traps. We placed the traps at each camera once a month, with 4 weeks between placement in the same location. Traps were hung for no longer than a week at a time, and we identified all captured insects to family level. We used R and Q-GIS software to extract metadata and compare spatial means of different vertebrate and invertebrate taxa across months. Spatiotemporal variation in scavenger density and richness with repercussions of animal movement on carrion fate will be discussed.

Sun- 39

Are Human Perceptions of the Environment Consistent with Ecological Data? A Study of User's Opinions and Water Quality in the Pocantico River, Westchester County, NY

Emily Schmidt (Pace University, Pleasantville, NY) and Mike Rubbo (Pace University, Pleasantville, NY)

Abstract - It is critical for human perceptions of the environment to accurately represent ecological conditions, as conservation efforts can be affected by public opinion. This influence is especially prevalent at the local-level where municipalities play a major role in land-use decisions. To determine if human opinions are consistent with environmental data, we performed a study to document user's opinions of stream health and water quality in the Pocantico River, Westchester County, NY. We split the 14.5-km (9-mi) Pocantico into 15 zones for social assessments and conducted interviews with users during the day, evenings, and on weekends. We performed rapid ecological assessments every 200 m along the entire length of the river with water-quality sampling conducted at strategic locations. Preliminary review of the social data show that compared to the perceptions of non-local users, local users believed the river was of poorer condition. Ecological and water-quality data showed the river to be in moderate condition; however, there were high levels of fecal bacteria found throughout testing sites. Currently, we are examining the social and ecological data to document any further relationships among these variables.

Sat- 37

Effects of Meta-community Structure and Biodiversity on Disease Prevalence in Amphibians

Reed Scott (University of Vermont, Burlington, VT) and Brittany Mosher (University of Vermont, Burlington, VT)

Abstract - We conducted surveys across 24 ponds in Vermont to assess amphibian biodiversity as well as prevalence of 2 amphibian diseases: Ranavirus and the Amphibian Chytrid Fungus (BD). This is an ongoing project in its first year of surveying. We will present preliminary results on the prevalence of Ranavirus and BD in different amphibian communities. We predict a dilution effect, wherein higher biodiversity results in decreased disease risk. In addition to being one of the first large-scale surveys of amphibian diseases in Vermont, these results should be informative about the relative risks of disease to amphibian communities. We also report how preliminary results may be used to adjust our survey efforts, as a form of adaptive research.

Sun- 26

The Vermont Butterfly Atlas: Past, Present, and Future

Nathaniel Sharp (Vermont Center for Ecostudies, Hartford, VT) and Kent McFarland (Vermont Center for Ecostudies, Hartford, VT)

Abstract - The first Vermont Butterfly Atlas (VBA1) took place from 2002 to 2007. VBA1 sought to educate and involve people in the discovery and protection of Vermont's natural heritage, determine the current and historic distribution of Vermont butterfly species, obtain baseline information on butterfly distribution and populations in Vermont, assess the conservation status of Vermont butterfly species, identify habitats of statewide and regional importance, and investigate the status of Vermont butterfly species of greatest conservation need. Thanks to a statewide network of 150 observers, VBA1 resulted in ~36,000 butterfly records representing 103 species, 11 of which were new state records. This vast database of butterfly records was instrumental in adding 16 species to the state list of species of greatest conservation ceed and assigning S-ranks to all butterfly species in the Vermont Natural Heritage Database. The years since this first atlasing effort have seen the arrival of new technologies such as eButterfly and iNaturalist, a steady increase in the number of community scientists in Vermont, and the discovery of an additional 4 butterfly species in Vermont. With new technologies, new insights on Vermont's butterfly diversity, and new budding lepidopterists all across the state, the Vermont Center for Ecostudies and partner organizations are announcing the Second Vermont Butterfly Atlas (VBA2), beginning in 2023. VBA2 will rely on the powerful checklisting tool eButterfly to document butterfly occurrences, allowing for even more robust data collection and analysis than VBA1. With the help of insights learned from VBA1, the checklisting capability and artificial intelligence identification assistance of eButterfly, and an expansive network of butterfly enthusiasts across the state, VBA2 will mark the most comprehensive assessment of the butterfly diversity of Vermont to date.

Sun- 41

Evaluation Of the Effectiveness of Tick-Mitigation Strategies On Reducing Tick Burden and Tick-borne Pathogens Across Pennsylvania

Elizabeth Signore (ESU, East Stroudsburg, PA), **Peter Babcock** (East Stroudsburg University [ESU], East Stroudsburg, PA), **Destiny Devlin** (ESU, East Stroudsburg, PA), Katelyn Barrett (ESU, East Stroudsburg, PA), Harold Quadrino (ESU, East Stroudsburg, PA), Michael G. Rowley (ESU, Jane Huffman Wildlife Genetics Institute, East Stroudsburg, PA), Matthew R. Williams (ESU, Jane Huffman Wildlife Genetics Institute, East Stroudsburg, PA), and Nicole Chinnici (ESU, Jane Huffman Wildlife Genetics Institute, East Stroudsburg, PA)

Abstract - Tickborne pathogens are harmful and widespread in humans, comprising over 75% of vector-borne disease cases in the United States. To assess the effectiveness of different mitigation strategies and ultimately reduce rates of tick-borne pathogen infection in Pennsylvania, we collected baseline data on adult *Ixodes scapularis* (Blacklegged Tick) density, small-mammal host abundance, and habitat variables. We selected a total of 18 sites, which included schools, parks, and residential communities across Monroe and Pike counties, to encompass a broad range of human–tick interactions. During fall 2022, the average tick density was estimated at 0.0052 ticks/m^2 and an average *Peromyscus leucopus* (White-footed Mouse) abundance was estimated at 30.95 per site. Model averaging revealed northern aspect directions to be the only strong predictor of tick density (estimate = -0.003, $P = 0.01$); northern aspect directions (estimate = -0.05, $P = 0.03$), leaf-litter depth (estimate = -0.003, $P = 0.001$), and date of sampling (estimate = -0.002, $P = 0.001$) were strong predictors of White-footed Mouse capture rates. These results, and future assessments (planned for spring 2023) will provide a baseline for future comparisons of tick and host abundance following the application of mitigation practices.

Sat- 20

Long-Term Patterns in Phytoplankton Community Composition and Abundance in Lake Champlain

Kayleen M. Snyder (SUNY Plattsburgh and Lake Champlain Research Institute, Plattsburgh, NY) and Tim Mihuc (SUNY Plattsburgh and Lake Champlain Research Institute, Plattsburgh, NY)

Abstract - Long-term monitoring data can be useful for understanding patterns and exploring potential drivers of changes in community composition over time. The purpose of this study was to examine long-term patterns in phytoplankton community composition and abundance in Lake Champlain from 1970 to 2021. We selected 7 study sites in various regions of the lake based on data from 1970 obtained from a previous study. We compared historical data with 2 recent time periods (2003–2005 and 2017–2021) using data from the Lake Champlain Long-term Monitoring program (LTM).We collected phytoplankton samples at twice the secchi depth and identified them to the lowest feasible taxonomic level. The results indicate that cyanobacteria and diatoms have been the dominant phytoplankton functional groups for the entire time period, with cyanobacteria becoming more abundant earlier in the growing season in 2017–2021 samples. In addition, there were detected shifts in the dominant phytoplankton genera within each functional group over time. Notably, *Anabaena* was the dominant cyanobacteria in 1970, but *Microcystis* has become more abundant in both 2003–2005 and especially 2017–2021. These results are most likely due to warming water temperatures. Shifts were also observed in the diatom community over time. Overall, phytoplankton are important ecosystem indicators since they are foundational to productivity in lake ecosystems, and changes in community composition could drive changes in water quality and influence the health of the lake ecosystem. Our results illustrate major long-term shifts in Lake Champlain's phytoplankton community since 1970.

Sun- 29

Evaluating Current Limiting Factors and Future Threats to Recovery of Endangered Roseate Terns

Jeffrey A. Spendelow (Emeritus USGS, Silver Spring, MD)

Abstract - Although it rebounded in the late 2010s, the endangered NW Atlantic breeding population of *Sterna dougallii* (Roseate Tern [ROST]) decreased by >25% from ~4300 "peak period" breeding pairs in 2000 to ~3000 pairs in 2008. The most important factors that caused the decline have not been determined, but the relatively slow population growth from 2008 to 2013 compared to the greater growth rate from 1992 to 2000 indicated that there had been a major change in one or more aspects of the population dynamics of this species. Started in 1987, the Cooperative Roseate Tern Metapopulation Project (CRTMP) is integrating results of several research studies to evaluate the relative importance of current factors and future threats that may limit population recovery. The CRTMP began expanding its staging-site studies (SSS) research in 2005 due to possible threats to this species from the construction and operation of offshore wind-energy turbines in the MA-RI-NY-CT area. This poster will present selected CRTMP results from work done at staging areas around Cape Cod, MA, and discuss future research needs.

Sat- 32

How Does Change in Land Use Impact the Water Chemistry Parameters in the Streams of Oswego County, NY

Madison Steates (SUNY Geneseo, Geneseo, NY), Thomas Back (SUNY Geneseo, Geneseo, NY), and Suann Yang (SUNY Geneseo, Geneseo, NY)

Abstract - Land use within a watershed is closely tied to stream water chemistry. Anthropogenic chemical inputs eventually make their way into streams, affecting fluvial ecosystems. Sources of these anthropogenic inputs change over time, especially when rural landscapes become increasingly urbanized. We studied the relationship between land use and stream water chemistry for Oswego County, NY, because riparian zones in this county have shifted to residential from agricultural and forested land uses. We extracted data from the New York State Department of Conservation (DEC) Department of Water (DOW) Monitoring Portal. Preliminary results show that total nitrogen (Kjeldahl) in mg/L fluctuates yearly from 2001 to 2020, total nitrogen in mg/L increased by 0.29 mg/L from 2009 to 2020, and total phosphorus decreased slightly from 2001 to 2015. Changes in land use do not appear to be substantial enough to have a large impact on these chemical parameters in Oswego County. However, the data collected for sites in Oswego County are sparse, and thus our results may be misleading. We will conclude with recommendations to Oswego County for a sampling strategy that better encompasses the major waterways of the county.

Sat- 38

Delimiting Varieties in *Cerastium velutinum*

Juliana Sweeney (Delaware Technical Community College, Stanton, DE) and Christopher Hoess (Delaware Technical Community College, Stanton, DE)

Abstract - *Cerastium velutinum* (Large Field Mouse-ear Chickweed) is a member of the *C. arvense* species complex endemic to the Appalachian floristic province. *Cerastium velutinum* var. *villosissimum* (Goat Hill Chickweed) has been described from a mid-Atlantic serpentine barrens, but is difficult to cleanly delineate from the typical variety. A population in northern New Jersey has also been ascribed to this variety, but is clearly distinct in habitat and possibly in morphology. We and others have made morphologically and ecologically diverse collections of *C. velutinum* to form the basis of an initial molecular phylogeny using existing nuclear markers.

Sat- 1

Soil Compaction Causes *Erythronium americanum* to Produce Aboveground Droppers

Jack T. Tessier (SUNY Delhi, Delhi, NY)

Abstract - *Erythronium americanum* () is a common spring ephemeral in the deciduous forests of the northeastern United States. Toward the end of its growing season, old corms produce a dropper to reposition one or more new corms within the soil profile. These droppers usually place the new corms deeper in the soil than the old corm, but occasionally the dropper goes aboveground near hiking trails. This study addressed the cause of this aboveground pattern. When corms were grown experimentally in compacted soil and drought conditions, only the compacted soil resulted in shallower droppers than the control. In a descriptive field study, aboveground droppers were significantly more common near trails where soil was more compacted than away from the trail. The results of this study suggest that soil compaction associated with hiking trails causes droppers to be shallower than away from the trail. This pattern may have natural history implications for populations of Trout Lily near hiking trails.

Sat- 3

Historical Woody Plant Species Composition on an Urban University's Campus

Adam M. Thomas (Utica University, Utica NY), Sara Rachon (Utica University, Utica NY), Chanel Chahfe (Utica University, Utica NY), Sarah Sharpe (Utica University, Utica NY), Hannah Stack (Utica University, Utica NY), and Sara E. Scanga (Utica University, Utica NY)

Abstract - Green spaces on university campuses allow for the intentional development of a plant community that can both benefit the local human population and serve as a hub for biodiversity. However, depending on which species are included in the landscape design, these areas also can contribute to the spread of invasive species into local habitats. We used unpublished landscape maps created by Utica University Professor Emeritus David Moore in 1996 to identify and quantify the woody plants, including trees and shrubs, that were present on campus at that time. Species were categorized as native, introduced (i.e., non-native but non-invasive), or invasive in New York (NY) using the USDA PLANTS Database and NY Natural Heritage Program's Invasive Species Database Program, among other sources. Although species richness was high on campus (n = 107), species evenness was quite low. Of the 1081 individual woody plants on campus in 1996, 49% were composed of just 5 species: *Taxus baccata* (Japanese Yew; n = 187) *Acer rubrum* (Red Maple; n = 129), *Gleditsia triacanthos* (Honey Locust; n = 89), *Picea pungens* (Colorado Blue Spruce; n = 68), and *Malus* spp. (crabapple; n = 58). The majority (64%; n = 69) of the species on campus were represented by less than 5 individuals. Angiosperms (n = 90 species; n = 713 individuals) were much more prevalent than gymnosperms (n = 17 species; n = 368 individuals). Native (n = 43) and introduced (n = 49) species comprised the largest portion of the campus's species richness, and only 5 of the 107 species found on campus were invasive (10 species we could only identify to genus and so were impossible to categorize). Similarly, invasive species only accounted for 6% of the total number of individuals (n = 61), with the dominant invasive species being *Euonymus alatus* (Burning Bush; n = 46). These results indicate that Utica University historically selected woody plant species that were either native or relatively innocuous to local ecosystems, resulting in a woody plant composition that was mostly non-invasive. The future direction of this project is to compare the woody plant composition on the present-day campus to the composition in 1996, to better understand how plant communities can shift in a human-controlled ecosystem.

Sun- 3

Environmental Parameters Associated with Eelgrass (*Zostera marina*) Reproductive Characteristics

Elinor Tierney-Fife (Bates College, Lewiston, ME), Brett Huggett (Bates College, Lewiston, ME), and Sylvia Yang (Padilla Bay National Estuarine Research Reserve, Mount Vernon, WA)

Abstract - *Zostera marina* (Eelgrass) is an important foundation species of many coastal ecosystems in the Northern Hemisphere, and is the most prevalent type of seagrass in the Northwest and Northeast of the United States. However, Eelgrass is highly threatened by anthropogenic activities, invasive species, and wasting disease. In the Northeast, New York waters have experienced a 75–90% loss of Eelgrass since 1930, and 27 out of 30 Massachusetts bays and estuaries saw eelgrass declines between 1994 and 2006. Restoration efforts are crucial to conservation of Eelgrass meadows, with recent methods focusing on restoration by seeding. In this study, we conducted monitoring surveys of 4 intertidal sites in Padilla Bay, WA, to determine abiotic and biotic characteristics of potential seed donor sites. We hypothesized that increased depth and light would lead to increased flowering shoot length and increased shoot density (respectively), and therefore higher reproductive output. We also hypothesized that higher stress levels (e.g., wasting disease, epiphyte cover, and increased temperature) may lead to higher flowering shoot densities and reproductive output. Abiotic meadow characteristics and Eelgrass reproductive characteristics varied across all 4 sites. Flowering shoot length and spathe number generally increased with increasing depth, particularly in the intermediate intertidal zone. Temperature and light varied across both site and transect, with deeper transects showing lower temperature and decreased light. There was no correlation between reproductive characteristics and epiphyte cover or Eelgrass wasting disease. We found that the presence of annual-type shoots at one of the sites may have contributed to increased flowering. Results suggest monitoring work should focus on specific environmental parameters—particularly flowering shoot density, flowering shoot length, depth, and temperature—observed to correlate with potential reproductive output in order to increase efficiency of future restoration projects in the Northwest and Northeast of the US.

Sat- 35

Invasive Hemlock Woolly Adlegid and Elongate Hemlock Scale in Western Massachusetts

Jacob Towsley (Westfield State, Westfield, MA), Tom Naughton (Westfield State, Westfield, MA), and Tim Parshall (Westfield State, Westfield, MA)

Abstract - *Tsuga Canadensis* (Eastern Hemlock) is a foundation species distributed throughout New England forests. It is commonly found in the understory and provides a unique habitat for a wide variety of vertebrate and arthropod species that rely on the tree for food, shelter, and reproduction. Eastern Hemlock is in decline due to 2 non-native pests, *Adelges tsugae* (Hemlock Woolly Adelgid [HWA]) and *Fiorinia externa* (Elongated Hemlock Scale [EHS]). Both HWA and EHS cause defoliation of the hemlock's needles. These 2 pests are currently limited by minimum cold temperatures and are unable to sustain a population in the northern part of the Eastern Hemlock's range. The last 100 years have been the warmest in recorded history, and temperatures are expected to continue to rise, this has created a general northward shift in species preferred habitat and has caused the spread of species that are limited by cold temperatures. In order to see the impacts of the 2 pests in western Massachusetts, we sampled 40 sites in the fall of 2008 and again in the fall of 2022. Observations of an altitudinal range expansion for both pests were noted. The 2008 infestation saw HWA at elevations of 135 m, the current infestation saw both HWA and EHS at elevations up to 530 m before a sharp decline in infestation. To better understand the potential range expansion of the pests in western Massachusetts, we deployed temperature loggers at 10 representative sites to record over-winter temperatures from December through February. We compared the 2022–2023 temperatures to the 2008 temperatures to see the impact of warming. We revisited the 10 sites in March and collected samples to determine the mortality rate of HWA and EHS. Using a combination of statistical methods and field sampling we are analyzing the range expansion of HWA and EHS.

Sat- 10

Evaluating Environmental Interference in Outdoor Automated Radio Telemetry Systems

Vinh Tuan Tran (Worcester Polytechnic Institute, Worcester, MA) and Marja Bakermans (Worcester Polytechnic Institute, Worcester, MA)

Abstract - Automated radio telemetry systems are a useful tool in tracking the activity and movement of wild animals. However, the habitats these radio networks are placed in can vary, affecting the signal strength received from tagged species. To investigate the influence of surrounding environments on automated radio signaling, this project was conducted at a restored and managed pine barrens habitat that consisted of a mix of mature *Pinus rigida* (Pitch Pine), treated Pitch Pine, *Quercus ilicifolia* (Scrub Oak), and hardwood forests. This site, Montague Plains Wildlife Management Area, Montague, MA, is also a known breeding ground for *Antrostomus vociferus* (Eastern Whip-poor-will). We used telemetry system nodes and radio tags produced by Cellular Tracking Technologies to measure the relationship of radio signal strength over multiple distances across each habitat. We produced exponential decay functions measuring radio signal strength over distance from the data points collected and used a post-hoc analysis to determine the impact of differing habitat types on radio signal readings. The exponential decay functions by habitat type significantly differed from each other, suggesting that habitats do vary in how they impact radio signal readings. As an example adjustment for this effect, we estimated known GPS locations with and without habitat calibration to compare which model was more accurate. From this study, it is suggested that habitats with more dense foliage between nodes and tags tend to have weaker radio signal readings, and require greater calibration adjustment for tracking animals crossing between habitats.

Sat- 44

The Relationship Between Mammals and Fallen Logs as Traveling Corridors in Saint Michaels College's Natural Area

Aimee M. Turcotte (Saint Michael's College, Colchester, VT), **Marissa Scott** (Saint Michael's College, Colchester, VT), and Declan McCabe (Saint Michael's College, Colchester, VT)

Abstract - Forests are a vital habitat that regulate temperature and provide natural resources for a wide diversity of biota. Trees capture and store carbon, which helps prevent climate change while favorably contributing to biodiversity. Fallen logs or coarse woody debris provide habitat and food sources for diverse animals. Additionally, fallen logs may act as obstacles or bridges for animals to access an area. However, there is limited research on whether coarse woody debris impacts animal travel. Weather conditions may impact mammal use of coarse woody debris. Snow cover may make it difficult for mammals to traverse fallen logs. It is unknown whether the frequency of animal travel changes depending on the season. Trail cameras facilitate investigation of animal use of fallen logs. We installed trail cameras in the Saint Michael's College Natural Area on fallen logs and at control sites. Research was repeated in summer and fall/winter to determine if snow, ice, and other weather conditions impact animal utilization of fallen logs. The data indicate that smaller mammals use fallen logs more frequently than larger species. There were more animal species present at sites with logs than control sites. Early fall had the highest mammal abundance. *Sciurus carolinensis* (Eastern Gray Squirrel), *Peromyscus* spp. (mice), and *Procyon lotor* (Raccoon) traveled along the lengths of logs roughly twice as often as they were observed crossing logs from one side to the other suggesting that coarse woody debris functions more as an aid to travel than obstacle. Our data emphasize the importance of fallen logs as travel routes through vegetation and other forest-floor obstacles. This research study provides forest managers with data suggesting importance of fallen logs beyond value as shelter and food sources.

Sun- 14

Snapping Turtle Nesting Trends Over Fifty Years in the Adirondack Park

FaithAnn Vanderwalker (SUNY College of Environmental Science and Forestrly [ESF], Syracuse, NY) and Stacy McNulty (SUNY ESF Adirondack Ecological Center, Newcomb, NY)

Abstract - Timing of oviposition is critical for many endothermic reptiles with long egg-incubation periods and temperature-sensitive sex determination. In response to increasingly warm spring temperatures, some species may lay eggs earlier in the season. We conducted longitudinal research on nesting timing of *Chelydra serpentina* (Common Snapping Turtle) at ESF's Huntington Wildlife Forest in the Upper Hudson River Watershed. Using observations beginning in 1968 and intensive population trapping and observation in summer of 2022, we tracked changes in annual mean, minimum, and median nesting Julian Day (n = 1017 observations in 54 years). In years with ≥20 observations (n = 18), mean Julian day decreased by 0.24 days ± 0.25 (SD)/year (R^2 = 0.24). In years with >10 observations (n = 30), median date of nesting decreased by 2.26 ± 0.27 days per decade (R^2 = 0.81). Removing 2022 data resulted in a decreased nest date of 1.55 days per decade (R^2 = 0.74). Average minimum nest date increased by 2.06 ± 2.5 days per decade (R^2 = 0.30). Variance of all 3 statistics decreased with time. Most notably by 2.5 days per decade (R^2 = 0.98) for the minimum nesting day. A decrease in variance may indicate a shortening of the nesting window. We also analyzed the minimum and maximum nest temperatures for days that turtles were observed nesting from 1968 to 2022 (n = 883). Mean maximum (23.30 °C ± 6.20 SD) and minimum (11.30 °C ± 4.12 SD) temperatures did not vary significantly over time. As climate continues to shift, nesting seasons may continue to shift along with it, which may lead to changes in incubation periods, and importantly the nest conditions during the incubation period experienced by Snapping Turtle embryos. A more complete study with standardized observation effort each year would minimize variability due to human observation effort and increase the sample size each year.

Sat- 41

Spatial Behaviors Between Coyote (*Canis latrans*) and Red Fox (*Vulpes vulpes*) Populations in Urban and Suburban Areas of the Hudson Valley

Isabella Vinces (Ossining High School, Ossining, NY)

Abstract - As *Canis latrans* (Coyote) populations continue to expand and thrive throughout heterogeneous habitats in North America, it is expected that their arrival will displace other resident apex predators, such as *Vulpes vulpes* (Red foxes). These species tend to avoid each other through spatial partitioning and interference competition in rural landscapes. There is limited research on Coyote–Red Fox interactions in suburban and urban areas. This was a two-part study that took a citizen science approach, including questionnaires for those who have seen at least 1 of these species. I put up flyers in towns throughout Westchester County and contacted organizations along with nature reserves to help spread awareness of this study. After collecteing the responses from the questionnaires, I analyzed them using Microsoft Excel to make pivot tables and graphs. I alos reached out to local police departments
for incident reports of these animals from the early 2000s through 2022. I then plotted the addresses of the sightings on a map using ArcGIS Survey123, with over 160 Coyote and Red Fox sightings recorded. Findings show that the majority of individuals who live in suburban landscapes feel that their Red Fox sightings have increased. Another finding was that there was very little overlap between Coyote and Red Fox sightings, suggesting that these animals avoid each other in suburban landscapes. Given that humans drive spatial patterns, ecological processes, and dynamics throughout these systems and environments, it is important that we understand these species interactions to better coexist with them.

Sat- 52

Molecular Identification of Green Lacewings in the Cryptic *Chrysoperla carnea* Group

Elizabeth J. Wade (Curry College, Milton, MA), and Erin Cullinane (Curry College , Milton, MA)

Abstract - The *Chrysoperla carnea* group (Common Green Lacewing) is composed of 21 morphologically indistinguishable cryptic species. Species are diagnosed and distinguished based on behavioral (substrate-borne vibrational duetting between males and females), distributional and ecological differences. Species identification takes time, specialized acoustic equipment and expertise. The COI barcoding gene does not reliably identify individuals to species since this is a recent radiation. In this project, we are trying to identify nuclear genetics markers that distinguish the North American species of this species group.

Sun- 34

Analysis of *Zostera marina* Patch Changes in Little Narragansett Bay, RI

Emily A. Watling (Department of Environmental Earth Science, Eastern Connecticut State University, Willimantic, CT), Peter V. August (The Watch Hill Conservancy, Watch Hill, RI), and Bryan A. Oakley (Department of Environmental Earth Science, Eastern Connecticut State University, Willimantic, CT)

Abstract - *Zostera marina* (Eelgrass) is a perennial marine angiosperm that grows in shallow bays and estuaries. It is an essential habitat and breeding ground for various marine organisms as well as a food source for migratory waterfowl. The largest contiguous patch of Eelgrass in the state of Rhode Island is in the Little Narragansett Bay (LNB) estuary located on the southwestern border of Rhode Island. The total Eelgrass patch area has been monitored on a semi-annual basis since 2012, with specific attention focused on the effects of Superstorm Sandy (October 2012). This study analyzes side-scan sonar, oblique aerial photography, digital orthophotography, and underwater video imagery to document and understand historical changes in the LNB Eelgrass bed. Based on aerial photography, a decrease in bed size occurred from 2012 to 2016, although it was noted that the 2012 northeastern extent was likely drift macroalgae, not Eelgrass. The extent of the beds measured using side-scan sonar increased between 2019 (0.52 km^2 [128 ac]) and 2022 (0.75 km^2 [185 ac]), and density also increased particularly in the southern beds. LIDAR surveys with bathymetric returns from 2010, 2014, and 2018 were analyzed to understand if there was a relationship between sediment deposition and/or erosion and bed-size changes. Vertical uncertainty between LIDAR datasets was greater than most measured values, so a correlation could not be identified. Deposition exceeded the uncertainty between 2010 to 2018 in small areas along the eastern border of the lower patch. This deposition likely increased the available habitat for Eelgrass growth. We established 5 paired 25-m transects within the southern bed to record Eelgrass presence and density. We will measure Eelgrass abundance along the transects for the next few years. As Eelgrass is such an important habitat and foraging ground for various species, annual monitoring of its extent and condition is vital.

Sun- 55

Tracking Fall Movements of Little Brown Bats from a Maternity Roost in Northeastern Pennsylvania

Howard P. Whidden (East Stroudsburg University, East Stroudsburg, PA), Amanda L. Kutcher (East Stroudsburg University, East Stroudsburg, PA), and Erica Spiess (East Stroudsburg University, East Stroudsburg, PA)

Abstract - We used Motus radio telemetry to track fall movements of *Myotis lucifugus* (Little Brown Bat) from a large summer maternity roost in northeastern Pennsylvania. We installed temporary local Motus stations with omnidirectional antennas near known hibernacula in Morris County, NJ, and Ulster County, NY, to detect visits to these sites, and also in a building 25 m from the maternity roost to monitor departures from the roost. We relied on stations in the Motus network to track regional movements of our bats. We captured 20 Little Brown Bats on 3–4 September 2021 and used surgical glue to attach Lotek NTQB2-2 nanotags to the interscapular region. The temporary Motus stations had periods of power loss resulting in several gaps in our data. The only permanent Motus station to detect the tagged bats was LACK04, which is 3.5 km south of the maternity roost. Tagged bats were detected for an average of 12 days, but 1 bat was detected for 50 days. Continued activity of all 20 bats near the maternity roost was confirmed by analyzing changes in signal strength over 24-hour periods; 6 of 20 tagged bats (30%) remained near the maternity roost through at least mid-October. This result was contrary to our expectations because there are no known hibernacula in the immediate area. We also documented 1 short-term 88-km movement (176-km round trip) of an adult female Little Brown Bat to the hibernaculum in Ulster County, NY, and then back to the maternity roost; we speculate that this trip may have been for fall mating.

Sun- 19

The Burning Question: How is Structural Diversity Shaped by Wildfire at a Jack Pine Barrens?

James Wholey (SUNY Plattsburgh, Plattsburgh, NY), Zach Hart (SUNY Plattsburgh, Plattsburgh, NY), Meghan Bargabos (SUNY Plattsburgh, Plattsburgh, NY), and Mark Lesser (SUNY Plattsburgh, Plattsburgh, NY)

Abstract - Forest structure is the spatial arrangement and volumetric capacity of the biotic components of an ecosystem. Understanding these characteristics and how they translate into ecosystem function and resilience is essential for sound management practices, particularly at landscape-scales. Patches within the landscape may contain varying structural characteristics due to land-use legacies, soil and hydrological properties, insect or pathogen outbreaks, and disturbance history. This structural diversity may increase overall diversity in wildlife and bird communities, as well as other ecosystem properties and functions. Our objective was to determine how disturbance history has shaped structural diversity across a northern New York pine barrens ecosystem. Our study area, the Altona Flat Rock, is a sandstone pavement pine barrens in northeastern New York dominated by *Pinus banksiana* (Jack Pine), a fire-dependent serotinous species, and an understory composed primarily of *Vaccinium augustifolium* (Lowbush Blueberry) and *Gaylussacia baccata* (Black Huckleberry). The Flat Rock barrens is surrounded by northern hardwood forest making it a unique habitat type for both wildlife and bird species. Within the pine barrens, wildfires have occurred in different areas in 1919, 1940, 1957, and 2018, which, along with silvicultural practices in 1998, have created a mosaic of stand ages (104, 83, 66, 5, and 25 years old, respectively), and corresponding structural attributes, across the ecosystem. To determine how forest structure changes between patches, we randomly selected 3 plot locations in each of twenty 1-km² grid cells that spanned the Flat Rock and parts of the surrounding hardwood forest (60 plots total). At each plot center, we used variable distance sampling to tally trees by species and diameter. We also collected data on tree height, canopy closure, downed woody debris, understory composition, and stand age. Preliminary analysis shows that Jack Pine density and basal area vary from 4135.03 to 52.5105 stems/ha and 20.673 to 2.297 m^2/ha, respectively. Quantifying forest structure in each of these patches and determining overall structural diversity will help interpret wildlife and bird community findings and begin to inform best-management practices on how different patch ages, sizes, and configurations can maximize diversity across all levels of the ecosystem.

Sun- 8

Using Snapshot USA to Investigate Local and National Trends in Fisher and Porcupine Interactions

Justin P. Wolford (Siena College, Loudonville, NY) and Daniel A. Bogan (Siena College, Loudonville, NY)

Abstract - Snapshot USA is a nationwide collaborative study designed to sample mammals across multiple habitat and development strata. The study began in fall 2019, and collaborators have completed 4 sampling periods during September–October. Data from 2019 and 2020 are published, whereas data from 2021 are in press, and 2022 field data are being analyzed. Cameras are deployed following the project's study protocol, using a minimum recommendation of 15 cameras, set for 30 days, with the goal of collecting 400 camera trap-nights. All cameras are spaced between 200 m to 5 km within each study area. We used 30 Browning trail cameras, with 15 set systematically at 210-m grid spacing for both the Albany Pine Bush Preserve (APBP) and Dyken Pond Environmental Education Center (DPEEC) within the Capital Region, NY. We investigated the potential for predator–prey interactions by examining the spatial overlap of *Pekania pennanti* (Fisher) and *Erethizon dorsatum* (North American Porcupine) measured at camera deployments. We calculated raw detection rates (detections per total trap-nights x 100) for Fisher and Porcupine, and compared these measures between 2 two study sites, and across the species ranges. Fisher and Porcupine were not detected at the same camera station for both years. Throughout both species ranges during the 2019 and 2020 study periods, Fisher were detected at 39 and 24 camera stations, and Porcupine were detected at 34 and 30 camera stations, respectively, per year. For both study years, (2019 and 2020), Fisher were detected greater in APBP (4.46 and 5.56) than DPEEC (2.02 and 3.13) and the species range (2.57 and 2.09). Interestingly, Porcupines appeared to exhibit an opposite pattern of Fisher for both years, and were not detected in APBP (0.00 and 0.00), yet detection rates for DPEEC (4.71 and 1.56) were similar to detection rates throughout the species range (4.08 and 3.08). Data from the Capital Region, NY, indicated Fisher may exhibit great relative abundance or activity within the suburban landscape compared to surrounding wildlands, whereas the suburban habitat of the APBP may be less suitable for Porcupine.

Sun- 16

Comparison of Two Methods for Collecting Aerial Insects on Eastern Massachusetts Conservation Land

Lucy Zipf (Wellesley College, Wellesley, MA) and Elissa Landre (Mass Audubon, Natick, MA)

Abstract - Decline in insect availability has been cited as a potential mechanism for the observed reduction in aerial insectivore populations in North America. Mass Audubon has a long history of monitoring bird populations and nest boxes on their wildlife sanctuaries to document bird population size and reproductive success. Insect monitoring, however, is typically a resource intensive process and has not been performed as extensively. This study aimed to compare insects captured on Mass Audubon conservation land using 2 collection methods, windsock and malaise traps, as well as 2 sampling durations, 12-hour and 48-hour trap deployment. Our goal was to identify a method that could be deployed alongside nest-monitoring surveys to gather information on prey availability across sites. In spring 2019 and 2021, we installed windsock and malaise traps at 2 locations, the Nature Center and Wildlife Pond sites, that contain nest boxes within Broadmoor Wildlife Sanctuary (Natick, MA). Standardizing for net hours, we found sampling duration made no significant difference in insects captured and concluded that the 48-hour duration is an easier method for community science use. Malaise traps collected a larger quantity and diversity of insects than windsocks at both sites; however, because these traps are lower to the ground than wind socks, they may miss high-flying insect species that are important to the diets of aerial insectivores. Windsock traps caught a much larger quantity of insects at the Nature Center than at the Wildlife Pond. This difference in quantity was not seen in the malaise trap samples, and may be indicative of highly localized environmental conditions, like topography and wind patterns, that differ between sites. Diptera was by far the most abundant insect order captured in both trap types. We also frequently saw insects from the orders Hemiptera, Hymenoptera, and Lepidoptera. Insects from all of these orders are known to be part of the diets of species of interest, including *Tachycineta bicolor* (Tree Swallow) and *Sialia sialis* (Eastern Bluebird), at Broadmoor and more broadly.

Sat- 22