2019 Northeast Natural History Conference Poster Abstracts

Listed in alphabetical order by first-listed presenter (names of presenters are in bold). 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).

Wildlife Response to Wildfire at the Altona Flat Rock Pine Barren in Northern NY

Matthew Adams (SUNY Plattsburgh, Plattsburgh, NY), Lloyd Staats (SUNY Plattsburgh, Plattsburgh, NY), Danielle Garneau (SUNY Plattsburgh, Plattsburgh, NY), Mark Lesser (SUNY Plattsburgh, Plattsburgh, NY)

Abstract - In July of 2018, ~221 ha of forest were burned in a wildfire at a sandstone pavement barren in Altona, NY. The forest overstory was predominantly *Pinus banksiana* (Jack Pine) and *Betula lenta* (Black Birch), whereas the understory wass comprised of ericaceous shrubs and *Pteridium aquilinum* (Bracken Fern). Within weeks of the burn, Jack Pine's sertoninous cone seeds had germinated and regeneration of fern stolons and birch stump sprouts appeared. We sought to monitor wildlife in response to forest regeneration at the sandstone pavement barren burn as compared to a reference (unburned) site. For this study, we installed 8 game cameras along transects traversing the burn intensity gradient and equally distributed across the burn and reference sites . We did not provide baits at the camera sites. Tracking diel wildlife activity was made possible using camTrap package in R Studio, which organizes image files according to metadata (e.g., time, temperature, species) and facilitates interpretation. Species recorded in the burn sites were *Odocoileus virginianus* (White-tailed Deer), *Canis latrans* (Eastern Coyote), *Leporidae* (Rabbit family), *Lynx rufus* (Bobcat), *Procyon lotor* (Raccoon), and *Pekania pennanti* (Fisher). In addition to these species, *Tamiasciurus hudsonicus* (Red Squirrel), *Sciurus carolinensis* (Gray Squirrel) and *Bonasa umbellus* (Ruffed Grouse) were observed in the reference but not the burn sites. In fall 2018, species richness was greater (n = 9) on the reference versus the burn sites (n = 6). In addition, there was greater wildlife abundance (n = 98) at the reference versus the burn sites (n = 44). Diel activity differed for some species between sites; in particular, White-tailed Deer activity was crepuscular at the reference site, with activity peaks at both 8 am and 6 pm, as compared to a single longer duration morning activity bout on the burn. Biodiversity typically responds positively to wildfire in response to regeneration; however this result was not observed in the first season following the disturbance. Continued monitoring of wildlife in response to wildfire may reveal differing patterns as the forest succesion proceeds.

Sun- 26

Comparative Study of Hymenopteran Pollinator Diversity

Jonathan Adamski (East Stroudsburg University, East Stroudsburg, PA) and Matthew Wallace (ESU, East Stroudsburg, PA)

Abstract - This project aimed to compare the diversity of hymenopteran pollinators between 2 sites found on East Stroudsburg University's main campus. The first site (TRACK) is highly disturbed with numerous anthropogenic habitat features. The second site was a powerline right of way (ROW), located on the north side of campus, and was bordered on both sides by forest. The TRACK site, experiencing higher levels of disturbance, was hypothesized to contain lower diversity than the ROW site (less disturbance). We sampled these sites once per week, weather permitting, using 2 sampling methods: bowl traps and sweep netting. Specimens were frozen overnight and then identified to the lowest taxonomic level. We quantitatively compared the diversity of the 2 sites using species richness, the Shannon index, and the Simpson index. We found that the diversity of the disturbed habitat was higher among all indices, contradicting the null hypothesis that disturbance reduces diversity. The high vagility of insects possibly allows them to exploit a disturbed site without being impacted by the disturbances themselves. The 3 major supergroups ("Symphyta", "Parasitica", and Aculeata) were also measured and compared across the 2 sites. The ratio of each group found at each site was nearly identical (within 1%). Finally, we conducted diversity measures as well as similarity indices (Bray-Curtis dissimilarity) on the collection methods. Sweep netting yielded much higher counts (n = 625) than bowl traps (n = 89), though the diversity measures of the 2 methods were identical. Lastly, the similarity value of the 2 collection methods was only 8.12%. Diversity measures were about the same, but similarity was low, suggesting that both methods are required to assess the wide range of diversity that can thrive among a given habitat.

Sat- 4

Estimating the Hydraulic Residence Time of the Bagaduce River Estuary in Maine using a Box Model

Alexandra Allen (Maine Maritime Academy, Castine, ME)

Abstract - Hydraulic residence time is one way to determine if an estuary flushes at a fast enough rate to support a healthy ecosystem. Hydraulic residence time is an important hydrographic characteristic to determine, especially when considering if an estuary can support future aquaculture hatcheries. I developed a 2-layer box model in MATLAB in order to determine if the hydraulic residence time of the Bagaduce River, ME, is fast enough to support *Crassostrea virginica* (Eastern Oyster) shellfish hatcheries. Data from the summer of 2017, such as salinity measurements, freshwater inputs, and volume of the estuary, were used to drive the model. The mean pulse residence times at the head of the river and at the mouth of the river were estimated at 10.51 days and 9.99 days, respectively. I concluded that the Bagaduce River has a fast enough residence time to promote a healthy estuary; however, more studies need to be conducted on phytoplankton biomass and nutrient density in order to determine if the Bagaduce River estuary could actually support Eastern Oyster shellfish hatcheries.

Sun- 49

Red Oak Seedling Growth and Survival as a Measurement of Whitetail Deer Browse in Northeast Deciduous Forests

Joshua Amir (Wildlife Technician Program, Mianus River Gorge, Bedford, NY)

Abstract - Deciduous forests in the Northeast face many pressures that threaten biodiversity. *Odocoileus virginianus* (White-tailed Deer) overbrowsing is a major contributor to biodiversity decrease in deciduous forests, resulting in a decline in the abundance and diversity of the vegetative community. I measured the impact of deer on *Quercus rubra* (Red Oak) seedlings, in terms of survival and number of leaves to indicate the overall effects of deer on forests. At the Mianus River Gorge, I maintained a crop of 60 Red Oak seedlings, along with 60 fenced seedlings from 2015. I found that the majority of unprotected seedlings died, but rodent predation on very young seedlings was a substantial contributor to this mortality along with deer browse on >2 year old seedlings. Fenced seedlings, as expected, had a higher survival rate of 60% on average. These results indicate that, while deer are a major factor, there are other substantial factors (e.g., rodent predation on acorns and young seedlings) limiting oak regeneration in the modern forest.

Sun- 24

Research and Workshops at Aton Forest Field Station

John Anderson (Aton Forest, Inc., Norfolk, CT)

Abstract - Aton Forest, Inc., owns and protects over 1400 acres of forest, fields, and wetlands in the Litchfield Hills of Connecticut and holds conservation easements on another 900+ acres. The organization was formed to preserve the lands assembled by Dr. Frank E. Egler as a natural area open to research and to continue the low impact, long-term ecological studies that he pioneered. We also maintain an archive of Dr. Egler's written material and library, and curates a portion of his house and furnishings as an informal museum. The aim is to preserve and continue the physical and intellectual legacy of our founder. Two research projects are highlighted in this poster: changes in flowering phenology spanning 70 years and breeding bird surveys spanning 12 years. A schedule of 2019 workshops hosted by Aton Forest, Inc., is also included.

Sun- 15

Factors Influencing the Fecundity of *Semibalanus balanoides* in the Gulf of Maine

Hallie Arno (College of the Atlantic, Bar Harbor, ME)

Abstract - *Semibalanus balanoides* (a species of acorn barnacle) is a hermaphroditic invertebrate that lives in the intertidal zones of boreo-arctic regions. Because it relies on cross-fertilization for reproduction, *S. balanoides* is a perfect species for studying density dependence in populations; it experiences negative density-dependent regulation through competition for space as well as positive density-dependence regulation through access to neighbors for cross-fertilization. This study investigated the balance of positive and negative density dependence in *S. balanoides* in the Gulf of Maine. I measured the fecundity of barnacles at different population densities, distances to the nearest neighbors, tidal levels, substrate sizes, and wave energy. Preliminary results indicate that the distance to the nearest neighbor and tidal level affect fecundity more than overall density. These findings complicate the issue of density-dependent fitness effects of competition, showing that barnacles touching 1 or 2 neighbors in a sparsely populated area will be more likely to reproduce than barnacles in a denser area that are not touching neighbors.

Sat- 51

Investigating American Bullfrogs as Potential Disease Reservoirs in Vermont and Brazilian Amphibian Communities

Lauren V. Ash (University of Vermont, Burlington, VT), Karla M. Campiao (Universidade Federal do Paraná, Panara, Brazil) and Nicholas J. Gotelli (University of Vermont, Burlington, VT)

Abstract - Ranaviruses are a group of emerging pathogens negatively impacting amphibian communities around the globe. This disease has the capability of causing sudden and mass amphibian mortality events; yet, the factors that influence it are not entirely understood, especially in areas where diversity and endemism are at their highest. The Atlantic rainforest of Brazil is one such area; however, neither amphibian diversity nor amphibian pathogen distribution and impacts are well-characterized. We have previously documented ranaviruses in relatively low prevalence across Vermont; however, *Lithobates catesbeianus* (American Bullfrog) communities have consistently had high ranavirus prevalence, with individuals retaining high amounts of virus. Although native to the northeastern United States, American Bullfrog is invasive in Brazil and has already negatively impacted native amphibian communities. American Bullfrogs have been suggested as a reservoir for other amphibian diseases, such as the chytrid fungus, due to the species' ability to withstand the onset of disease once infected. Additionally, ranaviruses have been detected in American Bullfrogs farmed in captive facilities in Brazil. Yet, it is unknown if wild Bullfrogs are infected and whether they are serving as disease reservoirs. The goal of this study was to determine whether ranavirus had spilled over from Bullfrog facilities into the natural Bullfrog populations in Brazil, and whether these individuals can retain large amounts of virus, similar to what we observed in its native range in Vermont. We collected a total of 58 American Bullfrog liver samples in multiple sites near the Atlantic Rainforest. These samples were tested for ranavirus using quantitative PCR to amplify a conserved region in its major capsid protein. We expect that ranavirus has indeed infiltrated the natural communities and believe American Bullfrog has the capability of being infected with the virus without showing any clinical signs, thus amplifying disease transmission in native anurans. If so, the American Bullfrog invasion poses an even greater threat to the biodiversity of the Atlantic Rainforest than previously supposed. These results will further our understanding of amphibian conservation efforts and allow us to identify areas of conservation priority.

Sun- 44

Phylogenetic Analyses of the Genus *Platismatia* (Parmeliaceae, Lichenized Ascomycetes) Shed New Light on Species from Northeastern North America

Olivia A. Asher (Macaulay Honors College at Lehman College (City University of New York), Bronx NY) and James C. Lendemer (Institute of Systemic Botany, The New York Botanical Garden, Bronx, NY)

Abstract - Few studies have been published on the relationships between species within the genus *Platismatia* using molecular phylogenetic analysis. Only 1 previous study specifically focused on the molecular phylogeny of *Platismatia*. This study used few sequences and did not include all of the species in the genus. In our study, we nerated new sequences (n = 44) of *Platismatia*: *P. glauca* (n = 17)*, P. herrei* (n = 3), *P. lacunosa* (n = 2)*, P. norvegica* (n = 3)*, P. stenophylla* (n = 2)*, P. tuckermanii* (n = 11)*,* and *P. wheeleri* (n = 6). We sequenced representatives of *P. glauca, P. norvegica,* and *P. tuckermanii* from Northeastern North America as part of this sampling. Particularly interesting aspects of the resulting phylogeny related to the clade including *P. glauca, P. tuckermanii,* and *P. wheeleri. Platismatia glauca* is a cosmopolitan species that was recovered into 2 separate strongly supported sister clades. Each clade contained species from both Europe and the Americas. We confirmed that *Platismatia* contains several asexual and sexual species pairs, for example *P. glauca* (asexual) and *P. tuckermanii* (sexual) as well as *P. herrei*(asexual) and *P. stenophylla* (sexual).

Sun- 35

An Analysis of the Warbler Community Assembly in the Northeastern United States

James Austin (Lasalle University, Philadelphia, PA) and James Church (Lasalle University, Philadelphia, PA)

Abstract - Biological communities are assembled in large part by the interactions of ecological mechanisms. In this study, we investigated community assembly of warblers in the northeastern United States of America. Null model analysis and Non-metric multi-dimensional scaling were used to assess the assembly and structure of these warbler communities. The results indicated that community assembly was not random, revealing a pattern consistent with competition structuring warbler communities. Further, ecological niche modeling, together with null-model analyses help to describe testable hypotheses regarding where interspecific competition may have a large role in structuring these species assemblages. These data on co-occurrence levels were applied visually to geographic space using GIS software. While the hypothesis that competition determines the structure of warbler assemblages is supported by the data, the roles of environmental constraint and evolutionary history will be discussed.

Sun- 14

SPARCnet Year 2: Mark-Recapture Reveals Variation in Abundance of *Plethodon cinereus* Within a Suburban Forest

Elena Babicz (Bridgewater State University, Bridgewater, MA), **Alexander O'Roak** (Bridgewater State University, Bridgewater, MA), Sarah Couto (Bridgewater State University, Bridgewater, MA, Emma Perry (Bridgewater State University, Bridgewater, MA), Julia Whalen (Bridgewater State University, Bridgewater, MA) and M. Caitlin Fisher-Reid (Bridgewater State University, Bridgewater, MA)

Abstract - The Salamander Population and Adaptation Research Collaboration Network (SPARCnet) is a group of researchers located across northeastern North America studying the effects of land-use change, climate change, and other factors on *Plethodon cinereus* (Eastern Red-Backed Salamander). Bridgewater State University joined the network in 2016, and began sampling in April 2017. This poster reports on 2 years of mark–recapture data within 6 primary plots and 1 year of mark–recapture data within 2 secondary plots started in April 2018. Across the original 6 plots, we have observed 861 total salamander captures (including recaptures) and we have marked 442 individuals over 2 years. From 2017 to 2018, our average recapture rate across the 6 primary plots has increased from 40% to 58%. In 2017, capture rates were higher in the fall (n = 305) compared to the spring (n = 203); however, this pattern was not observed in 2018, with fall (n = 174) and spring (n = 179) showing roughly equal capture numbers. In 2018, we started spring sampling 2 weeks earlier, and fall sampling 1 week earlier, which may explain the changes observed. We recently expanded this project by constructing 2 secondary plots in Fall 2017 with the intent of conducting experiments which may influence salamander abundance. Beginning in April 2018, we sampled the secondary plots once per week continuously through the end of October—compared to 6 weekly visits in each season (spring and fall) in the primary plots. In the secondary plots, we marked 90 individuals and observed 170 total salamander captures (including recaptures), with roughly equal captures in spring (n = 87 from April to June) and fall (n = 83 from July to October). Across all 8 plots, we continue to observe strong differences in abundance (min–max = 0.17–2.80 salamanders/m^2), and we will begin to test factors that may be affecting abundance (e.g., canopy cover) in the secondary plots in the upcoming 2019 field season.

Sat- 40

Responses of Small Mammal Communities to Local and Landscape Factors in a Forest/Agriculture Mosaic

Emily M. Beasley (University of Vermont, Burlington, VT)

Abstract - How do local and landscape processes affect community assembly? The relative contribution of these 2 spatial scales has been investigated in several taxa, but most authors analyze only the most common species in the community and fail to account for bias introduced by detection error. Hierarchical abundance models address both of these problems. They correct for detection error by leveraging information from across the community to estimate species-specific abundances and detection probabilities. Using small-mammal communities in forests, old fields, and active fields in Vermont as a model system, I will construct a hierarchical abundance model to (1) estimate site-level mammal abundances while correcting for detection error, (2) use estimated abundances generated by the model to determine regional and site-level species richness and diversity, and (3) determine the environmental covariates that are most highly correlated with these diversity measures. I predict that covariates associated with the local environment (e.g., canopy cover) will explain more variation in community structure than covariates associated with the landscape (e.g., distance to nearest road). Preliminary tests of the hierarchical abundance model with simulated data demonstrate that the model produces accurate estimates of small-mammal abundance, diversity, and covariate significance at middle to high detection probabilities. Model estimates are less accurate at low detection probabilities, but are still an improvement over uncorrected data. These early findings suggest that the modeling framework will successfully reduce the bias in detection error and better estimate the relative contribution of local and landscape processes to small-mammal communities compared to other approaches.

Sun- 38

Using Temperature Distributions within the Canopy to Model Free Convection in Bryophytes

Elsa Bechu (Union College, Schenectady, NY) and Steven Rice (Union College, Schenectady, NY)

Abstract - Non-vascular bryophytes cover soil surfaces in many boreal and peatland environments, contributing to water and energy exchange within the ecosystem. Prior research has led to a good understanding of how conductance to water vapor relates to wind speed (i.e., under forced convection), but little is known about mechanisms that govern free convection under still conditions. Lab studies show that temperature gradients exist within bryophyte canopies, with individual canopies varying 4–5 ° C due to evaporative cooling effects. Also, significant relationships were found between temperature ranges and vapor pressure deficits (VPD) that related to conductance, as temperature gradients can cause air density differences that drive free convection. The purpose of the present study is to determine if such relationships exist in the field and alter an existing model of convection from bryophyte layers to account for free convection at low wind speeds. To determine if temperature gradients exists within bryophyte canopies in the field, we developed a portable 3D thermal imaging system to map shoot temperatures in 3D space. We analyzed the distribution of shoot temperatures at 2 field sites in central and upstate New York to determine temperature gradients and temperature ranges within canopies of *Hylocomium splendens*, *Rhytidiadelphus triquetrus*, and *Polytrichum commune* and compare them with VPD. The temperature range and VPD data collected in the field formed a continuum with the data collected under laboratory conditions, although the VPD was lower in the field. Using this combined relationship, we altered Launianen et al.'s model of bryophyte conductance to water vapor under forced convection to include free convection. The altered model accounts for free convection controlled by VPD influencing temperature ranges within the canopy at low wind speeds (<0.6 m/s). In this range, conductance was 4- to 6-fold larger than the model developed by Launiainen et al. due to the temperature differences within bryophyte canopies causing free convection. A full model is presented accounting for conditions where free and forced convection dominate conductance to water vapor.

Sat- 19

Decline in Growth and Productivity of Sugar Maples in the Northeastern Adirondacks

Patrick M. Bly (SUNY Plattsburgh, Plattsburgh, NY) and Mark Lesser (SUNY Plattsburgh, Plattsburgh, NY)

Abstract - Recent surveys on *Acer saccharum* (Sugar Maple) populations in the northeastern United States and in eastern Canada have revealed declines in productivity and negative trends in growth patterns. Sugar Maple is of great ecological significance, as it provides refuge and resources for many species of ungulates, small mammals, insects, and birds. Sugar Maple is also an important economic resource throughout northeastern North America as a highly sought-after timber species and for its sap that is used for maple syrup production. Sugar Maple decline has historically been monitored based on the outward appearance of trees, and while this may be a good indicator, it does not reflect if the decline is related to actual growth. The objective of this study is to determine if decline is evident in the growth trends of Sugar Maples in northeastern New York. To determine growth trends, we cored 51 trees in 4 populations around the Champlain Valley in New York. Trees in 3 of these populations are currently tapped for syrup production, while the fourth stand has never been tapped. In each population, trees were observed for outward symptoms of decline (i.e., crown dieback), but all sampled trees appeared completely healthy. Increment cores were prepared and measured using standard dendrochronological techniques. Ring-widths will be crossdated and detrended before analysis to determine overall growth trends and relationships between growth, climatic, other abiotic factors, and any potential impacts that tapping has had on growth. Understanding Sugar Maple decline will provide us with a better understanding of trends that are occurring in this species at the population level, along with insight into compositional and structural changes that may occur with decreasing Sugar Maple health and abundance.

Sun- 18

Known Range Expansion for Two Clam Shrimp Species in Massachusetts

Kourtnie Bouley (Massachusetts Army National Guard, Camp Edwards, MA),]Matthew Penella (Massachusetts Army National Guard, Camp Edwards, MA), Annie Curtis (Massachusetts Army National Guard, Camp Edwards, MA), Robert Crevey (Massachusetts Army National Guard, Camp Edwards, MA), and Jacob McCumber (Massachusetts Army National Guard, Camp Edwards, MA)

Abstract - In July 1997, the first record of *Eulimnadia agassizii* (Agassiz's Clam Shrimp) was collected at Camp Edwards, a Massachusetts Army National Guard (MAARNG) training site on Cape Cod. Prior to 2015, this G1, MA state-endangered species was confirmed in at least 5 puddles within 5 towns in Massachusetts and 1 puddle in Connecticut. The MAARNG Natural Resources and Integrated Training Area Management Program (NR-ITAM) began rigorous efforts in 2015 to reaffirm rare species records that had not been documented within 15 years. Concurrently, an intensive puddle-monitoring program was initiated to assess the ecological benefits or impacts of roadway puddles throughout the dirt and gravel road network of the training site. These combined efforts created an ideal situation for discovering and monitoring clam shrimp. Despite the challenges of detection due to the short-lived nature of this species, clam shrimp were found rather frequently at the base. To date, *E. agassizii* has been documented in 24 puddles at Camp Edwards. Consequently, we began a coordinated effort with MassWildlife to investigate clam shrimp existence and distribution off-base. We surveyed other state and town properties from July through September 2018. These surveys revealed the presence of *E. agassizii* in 19 puddles in 6 new towns within Barnstable, Bristol, and Plymouth counties, notably expanding upon its known range in Massachusetts. Another species of clam shrimp, *Cyzicus gynecia* (Mattox Clam Shrimp), was unknown in Massachusetts until Smith and Gola reported it in 2 puddles within Berkshire county in 2001. *C. gynecia* has now been found in 3 puddles at Camp Edwards, substantially expanding upon its known range in Massachusetts. We believe further, targeted exploration will result in additional discoveries and a better understanding of clam shrimp ecology and distribution in the region.

Sat- 37

Flocking Patterns of Black-capped Chickadees (*Poecile atricapillus)* in Urban Versus Rural Areas

Abigail R. Burke (Salve Regina University, Newport, RI) and Jameson F. Chace (Salve Regina University, Newport, RI)

Abstract - Although currently an abundant species, *Poecile atricapillus* (Black-capped Chickadee) relies heavily on a combination of wooded and open habit to find food and form protective winter flocks. Optimal flock size is a trade-off between predatory threats and energetics of food availability and handling time. We observed mixed flocks between October and April during winters of 2016–2019 and measured total flock size and species composition. We observed 101 flocks in an urban site (n = 28), a suburban campus (n = 23), 2 mature *Quercus* (oak) and *Fagus* (beech) forests (n = 39), and an urban riparian conservation easement (n =11). The number of Black-capped Chickadees in a flock varied from 1 to 15 (mean = 3.7), and there were significantly more Black-capped Chickadees in flocks at urban sites than rural sites ($P < 0.001$). Mean flock size was 6.6 birds and was significantly larger in urban and suburban sites. Flock size and total number of chickadees in the flock were positively correlated. Urban sites tend to have greater edge habitat and have higher vulnerability to predation offset by higher abundance and quality of foods selecting for larger flock sizes.

Sun- 7

Competition for Seed Dispersers Between Native and Invasive Plant Species

Evan A. Burr (SUNY Geneseo, Rochester, NY) and Suann Yang (SUNY Geneseo, Rochester, NY)

Abstract - In fruiting plants, competition for seed dispersers is an important factor in regeneration of the population. Partitioning niches across either disperser type or time facilitates the coexistence of plant species in a habitat filled with competing plants. An example of a habitat where invasive fruiting species are common are secondary successional forests such as SUNY Geneseo's Roemer Arboretum, with its variety of native and invasive fruiting species. We analyzed the fruit production over 2 fruiting seasons for a selection of invasive species, such as *Lonicera maackii* (Amur Honeysuckle) and *Lonicera morrowii* (Morrow's Honeysuckle), and native species, such as *Parthenocissus quinquefolia* (Virginia Creeper) and *Cornus racemosa* (Gray Dogwood), to identify any partitioning of temporal niches and how this might influence the species interactions. For the same plants each week, we counted the number of fruit present in 3 stages (green, intermediate, and ripe) for 2 fruiting seasons. Our results show that multiple invasive species overlap in fruit production with native species, though between-year variation in phenology changes the degree of overlap. Thus, we found evidence for competition between native and invasive species for fruit dispersers. This overlap could cause stress on the native species population regeneration should they be outcompeted by an invasive counterpart.

Sat- 12

A Preliminary Floristic Survey of the High Tor Wildlife Management Area (Naples, NY)

Vivian Chappell (Department of Biology, Houghton College, Auburn, NY) and James Wolfe (Department of Biology, Houghton College, Houghton, NY)

Abstract - The High Tor Wildlife Management Area at the southern shores of Canandaigua Lake, close to Naples, NY, is comprised of 2752 ha (6800 acres) of old fields, marshes, ravines, and forests. It lies close to the Valley Heads Moraine separating the Finger Lakes watershed with that of the Susquehanna River. We conducted a floristic survey of the vascular plants of the South Hill segment of the High Tor WMA, including Clark Gully, starting in late summer 2018. We photographed then identified and recorded plants using local keys and the USDA plant database to compile an inventory cataloguing diversity of wildflowers, shrubs, trees, and ferns. To date, we have identified and catalogued 145 plant species in 54 plant families. Of these, we identified 5 families of ferns and fern allies, 1 family of gymnosperms, 4 families of monocots, and 44 dicot families. We found 13 introduced species, including 7 that are considered invasive in the state of NY: *Centaurea maculosa* (Spotted Knapweed), *Lonicera tatarica* (Tartarian Honeysuckle), *Elaeagnus angustifolia* (Russian Olive), *Lythrum salicaria* (Purple Loosestrife), *Fallopia japonica* (Japanese Knotweed), *Rhamnus cathartica* (European Buckthorn), and *Rosa multiflora* (Multiflora Rose). We also identified 7 species that are considered rare in NYS and are on the watch list for the NY State Department of Environmental Conservation: *Arisaema triphyllum* (Jack in the Pulpit), *Aslenium rhizophyllum* (Walking Fern), *Collinsonia canadensis* (Horsebalm/Stoneroot), *Pycnanthemum muticum* (Mountain Mint), *Hasteola suaveolens* (Sweet-Scented Indian Plantain), *Agrimonia striata* (Woodland Agrimony), and *Polygonatum biflorum* (Solomon's Seal). This survey adds to our understanding of a valuable ecosystem accessible to the public and have future plans to survey the other portions of these protected lands.

Sat- 16

The Effect of Attempted Pilferage by Humans on Caching Behavior of Eastern Gray Squirrels

Brenna Cianci (Central Connecticut State University, New Britain, CT), **Heath Chapin** (Central Connecticut State University, New Britain, CT), Kenneth Artsma (Central Connecticut State University, New Britain, CT), Caroline Borowski (Central Connecticut State University, New Britain, CT), and Sylvia Halkin (Central Connecticut State University, New Britain, CT)

Abstract- Nut-storing *Sciurus carolinensis* (Eastern Gray Squirrel) deters theft by conspecifics in a number of ways, including storing nuts in the open, where potential pilferers would be more exposed to predators; misdirecting would-be pilferers by digging (and sometimes covering) extra, unused holes; and by simply moving farther and taking longer to choose a storage site, hampering pilferers' efficiency. To determine squirrels' responses to targeted pilfering by humans, we tested 6 individually identifiable squirrels in experiments that ran from ~3:30 pm to dusk, in a city park and on our university campus in New Britain, CT, from September to November 2018. In the first phase of each experiment, we followed a squirrel as it cached 10 hazelnuts in intact shells; we noted whether each nut was cached under tree canopy or in the open, and provided a new nut after each nut was cached. For 4 squirrels, we measured the distances that the squirrels carried the nuts before they cached them; for the other 2 squirrels, we measured the times that the squirrels took to cache nuts. In the second phase of the experiment, as the same squirrel continued to cache nuts, a designated team member attempted to dig up each nut cached under tree canopy. In this phase, a new hazelnut was provided as the squirrel left each cache it had made in the open, and after the pilferer had attempted to dig up each nut buried under tree canopy. We found that our pilfering attempts did not cause squirrels to bury more nuts in the open, perhaps because they knew from previous experience that people (unlike pilfering squirrels) do not hesitate to spend time in the open. As squirrels continued to bury nuts, they moved shorter distances to make caches, and buried nuts more quickly. Over the course of the experiment, squirrels likely learned that we would continue to supply additional nuts regardless of whether we had attempted to pilfer the previous nut. As dusk approached and remaining time to forage decreased, relatively rapid caching would result in more total nuts cached, offsetting losses even if some nuts were pilfered.

Sat- 29

Response to Land-clearing Disturbance by the Red-backed Salamander: A Preliminary Analysis

Carissa A. Colby (Elms College, Chicopee, MA) and Douglas F. Fraser (Siena College, Loudonville, NY)

Abstract - Movement and habitat selection are population characteristics central to understanding and managing threatened populations. *Plethodon cinereus* (Red-backed Salamander) is associated with the litter-humus layer of forests where, owing to high abundance, it occupies a central role in the forest food web. Despite its well-documented sedentary behavior, e.g., short moves centered on cover objects, there are increasing and unexplained reports of movement beyond the normal home range into alternate habitats by some component of the local population. We found an instance of such transient movement of individuals from forest to adjacent bare-soil-habitat that followed construction activity. The detritus layer of the forest is completely absent in the open, pre-successional habitat we studied. We test the hypothesis that differences in food availability is related to movement into what otherwise might be unsuitable habitat. We predicted that the observed movement would be positively correlated with differences in the invertebrate prey, e.g., mites and springtails, between the 2 contrasting habitats. We sampled the invertebrate fauna beneath and adjacent to artificial cover objects that had been placed in each habitat. Preliminary analysis shows a greater abundance of food in the forest than in the open habitat, suggesting that a simple difference in overall abundance cannot alone account for the observed movement. Additional studies to replicate the disturbance and to investigate additional hypotheses to explain the observed shifts in habitat use.

Sat- 41

Effect of Forest Fragmentation on Parasitoid Attack of Moth Caterpillars of Contrasting Diet Breadth

Christian Connors (University of Connecticut, Mansfield, CT), James Mickley (University of Connecticut, Mansfield, CT), Riley M. Anderson (Wesleyan University, Middletown, CT), Nicole M. Dallar (Wesleyan University, Middletown, CT), Michael S. Singer (Wesleyan University, Middletown, CT), and Robert Bagchi (University of Connecticut, Mansfield, CT)

Abstract - Parasitoids are a major component of terrestrial ecosystems, and act as a means of top-down control of herbivorous insect populations. Forest fragmentation can substantially impact the distribution of lepidopteran hosts of parasitoids and disrupt parasitoid dispersal and population dynamics. Understanding forest fragmentation's impact on parasitoids is essential to anticipating moth distribution and population shifts due to deforestation. We observed parasitoid attack rates on laboratory-reared caterpillars collected on *Acer rubrum* (Red Maple) and *Hamamelis virginiana* (Witchhazel) in forest fragments of varying size across eastern Connecticut. Dietary specialist caterpillars were found to have a higher probability of parasitism than dietary generalists. Additionally, parasitism of dietary specialist (but not dietary generalist) caterpillars increased with fragment size and was nearly twice as likely in large (1000 ha) than in small (~3 ha) forest fragments. We suggest that a decrease in parasitism in smaller forest fragments is likely due to fragment isolation. Parasitoids of specialist herbivores may be poor at dispersing through intervening non-forest landscapes and could be vulnerable to local extinction.

Sun- 27

Behaviors in Captive Red-eared Sliders (*Trachemys scripta elegans*) Compared to Wild Populations

Jennifer Coppa (USJ, West Hartford, CT), Kirsten Martin (USJ, West Hartford, CT), Teri Rice (USJ, West Hartford, CT), Mabintou Darboe (USJ, West Hartford, CT), Wendy Cotto (USJ, West Hartford, CT), and Darla Watson (USJ, West Hartford, CT)

Abstract - There is abundant literature on the impact of captivity on the behavior of mammals, but there appears to be a gap in the field regarding the behavior of captive reptiles. Upon observing a female captive *Trachemys scripta elegans* (Red-eared Slider) living in the basement of McDonough hall at University of Saint Joseph, behaviors were seen that are not typical of Red-eared Sliders in the wild. The most notable behavior exhibited by the captive turtle was the duration which the turtle kept her head in the far-left corner of the tank. Upon further analysis of environmental factors such as air temperature, water temperature, UVB light levels, and foot traffic, the head-in-corner behavior is most likely due to stress and exposure to outside stimuli and reflection in the glass walls of the tank. Wild sliders will often retreat to the deepest end of the pond and hide when startled—a behavior that is not available in the research subject's current environment, causing her excess stress. In this research project, in order to decrease this stress behavior, corners of the tank will be lined with a cap of black, non-transparent corrugated plastic to minimize reflection in the glass. The caps will be different lengths (starting at 3 inches long) and go up the entire length of the tank. We will record the turtle's behavior with no cap as well as treatments with a cap on the back left corner only, front left corner only, and both corners, and determine if minimizing reflection in the glass reduces the head-in-corner behavior.

Sat- 47

An Analysis of Spatial Synchrony of Population Dynamics of the Asian Shore Crab

Alexis Correira (Bridgewater University) and Christopher P. Bloch (Bridgewater University)

Abstract - The invasive *Hemigrapsus sanguineas* (Asian Shore Crab) has been flourishing in the United States east coast since its introduction in 1988. Its omnivorous behavior and high fecundity allow it to spread rapidly and survive to reproductive age. This study observed the fluctuation in population over the course of 5 years (2014–2018). Since many biotic and abiotic factors differ at each site, we hypothesized that sites with higher crab abundances would consistently have more crabs and that population fluctuations would vary at different latitudes. We used Pearson Correlation tests and *t*-tests to determine the presence of a relationship between geographic location and crab abundance over the 5-year period. We used Kendall rank correlation coefficient to test for consistency in the ranking of sites over time. The preliminary results indicate that no relationship exists between latitude and fluctuations in Asian Shore Crab abundance. However, we observed consistency in Asian Shore Crab abundance among individual sites over time.

Sat- 53

Population Dynamics of Painted Turtles (*Chrysemys picta*) from a Connecticut Farm Pond

Ryan DeBernardis (Fairfield Ward High School, Fairfield, CT) and Antonios Pappantoniou (Housatonic Community College, Bridgeport, CT)

Abstract - Aspects of the population dynamics of *Chrysemys picta* (Eastern Painted Turtle) were studied at a Connecticut farm pond. This study has been ongoing since 2010. We used hoop traps to capture turtles. Individuals were measured and weighed, had their gender determined, marked with a unique alphabetic identifier, and released at their point of capture. Results of this study showed that female Painted Turtles averaged 130 mm in carapace length and weighed an average of 333.9 grams, whereas males averaged 264.3 grams and had an average carapace length of 125.1 mm. The male:female ratio was 1.13:1.0. These results are in agreement with similar studies of the population dynamics of the Eastern Painted Turtle. The catch per unit effort remained within a narrow range for the years 2010–2013, but dropped during 2015. This may reflect a drop in the Painted Turtle population of this pond caused by the severe winter of 2014–2015.

Sun- 42

Mechanisms that Drive Breeding Success of Swainson's Thrush on an Elevation Gradient

Sarah C. Deckel (UMass Amherst, Amherst, MA, David King (US Forest Service, Amherst, MA; daveking@eco.umass.edu), Alexander Gerson (UMass Amherst, Amherst, MA), and William DeLuca (Northeast Climate Adaptive Science Center, Amherst, MA)

Abstract - *Catharus ustulatus* (Swainson's Thrush) breed in the White Mountain National Forest of New Hampshire across a broad elevational range (300–1200 m). Previous literature shows their abundance is high at mid-elevation habitats (~800 m) than those at the elevational extremes (300–500 m; 900–1200 m). Analysis of preliminary data confirms high rates of nest predation at low elevation, and smaller clutch sizes in nests at high elevation that may be driven by low temperatures and increased precipitation levels. The authors propose the observed low abundance at low elevations are due to biotic (predation and food abundance) factors, whereas limitations at high elevations is caused by abiotic (temperature and precipitation) factors.

Sat- 31

Effect of Aphid Density on Monarch Abundances in Milkweed Populations

Elizabeth M. Deecher (East Stroudsburg University, East Stroudsburg, PA;) and Emily J. Rollinson (East Stroudsburg University, East Stroudsburg, PA)

Abstract - Eastern North American *Danaus plexippus* (Monarch Butterfly) populations have substantially declined over the last 2 decades. This decline may be caused by the effects of drought, hurricanes, unusually warm fall temperatures, and pesticides. Loss of habitat may also be an important factor, including declining populations of their host plant *Asclepias syriaca* (Common Milkweed). Availability of milkweed to monarchs may also be affected by the spread of the invasive insect *Aphis nerii* (Oleander Aphid), which can weaken these plants. Milkweeds with high aphid loads may not be attractive to Monarchs Butterflies, or have sufficient free surface area to support monarch caterpillars. Therefore, Oleander Aphid may have an indirect negative effect on monarch butterflies. We conducted surveys of abundance of Monarch Butterflies and Oleander Aphids in populations of Common Milkweed and other *Asclepias* species. In each milkweed population, we identified the milkweed species present and measured the size of the milkweed population, density of aphids on milkweed leaves, and abundance of Monarch Butterfly caterpillars on each plant and across the entire population. Of the 23 populations surveyed, 5 had monarch caterpillars present, and 18 lacked monarchs. We found no significant difference in aphid abundance between monarch-inhabited and -uninhabited milkweed populations. Additionally, within milkweed populations where monarchs were observed, there was no significant difference in aphid density on individual milkweed plants with or without monarch caterpillars. These findings suggests that aphids may not reduce the ability of monarchs to use a milkweed population, and that other characteristics of the milkweed population are stronger determinants of whether monarchs are present.

Sat- 2

Size Class and Population Densities of Mysids (*Mysis diluviana*) in Lake Champlain

Lily L. Delmarsh (SUNY Plattsburgh, Plattsburgh, NY), Tim Mihuc Ph.D (Lake Champlain Research Institute Plattsburgh, NY), and Mark LaMay (Lake Champlain Research Institute Plattsburgh, NY)

Abstract - *Mysis diluviana* is a glacial marine relict species of omnivorous crustacean present in Lake Champlain. *Mysis diluviana* migrate vertically throughout the water column feeding on copepods, cladocerans, and phytoplankton. The Lake Champlain Long Term Monitoring Program monitored *Mysis* densities from 1992 through 2018, over which period of time the *Mysis* population has declined dramatically. However, data from 2018 show the highest densities of *Mysis* since 2008. In addition to analyzing overall *Mysis* densities, we examined body length of all male, female, and juveniles and categorized them into size classes. Analysis of these densities and size classes suggest that the size of males and juveniles has remained consistent throughout the study, while overall densities increased in 2018. The size of females however has increased slightly as well as their overall density. There are many potential contributing factors influencing the decline and subsequent increase in the *Mysis* population, including the introduction of the invasive *Dreissena polymorpha* (Zebra Mussel) in 1996 and *Alosa pseudoharengus* (Alewife), which invaded Lake Champlain between the years of 2006 and 2007. A second potential contributing factor for the overall trends in densities and sizes are fluctuations in the zooplankton community, which comprise the main food source of *Mysis* in Lake Champlain.

Sun- 51

Native Bee Response to Grassland Restoration and Wildfire

Lauren Smith DiCarlo (Westfield State University, Westfield, MA) and Sandra J. DeBano (Oregon State University, Hermiston, OR)

Abstract - Up to 99.9% of native North American grasslands have been degraded since European settlement. Today, grasslands are a top priority across the continent for restoration as they provide essential habitat for many rare and endangered species. The majority of studies in grasslands have focused on vegetation or vertebrate responses to restoration while largely neglecting invertebrates. Grassland invertebrates are highly diverse and provide important ecosystem services such as pollination, nutrient cycling, food for vertebrates, and pest control. This study seeks to understand how grassland restoration and wildfire impacts native bee communities in a bunchgrass prairie and identifies several environmental variables closely associated with these communities. Bee community composition at native (uninvaded by invasive plant species) sites differed from both the degraded (highly invaded by invasive plant species) and restored communities, which did not differ from each other. However, there was no statistically significant difference in bee abundance, richness, and diversity among degraded, restored, and native sites. We found that bee abundance was most closely associated with litter cover, bee richness was associated with maximum vegetation height and floral abundance, and bee diversity was associated with floral abundance. After a large wildfire, community composition of native bees was significantly altered. The fire did not affect bee abundance but significantly increased diversity and richness of native bees. Environmental variables such as abundance of invasive annual grass and extent of biological soil crust declined significantly, while forb abundance increased after the burn. Taken together, these findings show that the responses by native bees to grassland restoration and wildfire in inland Pacific Northwest grasslands are complex, and this case study provides important information that is likely to apply to other grassland sites across North America. Future bunchgrass restorations (including those in the Northeast) should consider how management practices, including prescribed burning, alter potential nesting sites (grass and litter cover) and floral resources (floral abundance). Depending on the degree that these environmental factors are influenced during the restoration process, managers may expect to see variable changes in bee community responses.

Sat- 3

Mixed Consequences of Divorce on Reproductive Success of Songbirds Nesting in Agricultural Hayfields

Kylee DiMaggio (University of New England, Biddeford, ME), Noah Perlut (University of New England, Biddeford, ME), and Allan Strong (University of Vermont, Burlington, VT)

Abstract - Agricultural management, particularly haying, causes synchronous nest failure of ground-nesting songbirds; however, these birds may subsequently re-nest and may choose a new social mate (divorce). This study (1) quantified within- and between-year divorce rates of grassland songbirds, and (2) determined if divorce rates differed after haying or predation-caused nest failure, and if so, whether divorce influenced reproductive success. From 2002–2017, we monitored 121 *Dolichonyx oryzivorus* (Bobolink) pairs and 436 *Passerculus sandwichensis* (Savannah Sparrow) pairs in an agricultural region of Vermont. Within- and between-year divorce rates were 0% and 84.9% for Bobolinks and 17% and 69.1% for Savannah Sparrows, respectively. Between years, Bobolinks, but not Savannah Sparrows, were more likely to divorce after nest failure but haying did not influence divorce rates. Within-year, Savannah Sparrows were more likely to divorce after nest failure, but as with Bobolinks, divorce rates in Savannah Sparrows were not different between nests that failed due to haying or predation. Across all Savannah Sparrow renests, divorce had no influence on the number of young fledged per female. However, between years, female Bobolinks that divorced fledged fewer young post-divorce while female Bobolinks that re-paired fledged more young in their second attempt. This study showed that pairing decisions were not differentially affected by cause of nest failure. Further, we identified no reproductive benefit to divorce.

Sun- 13

Quantification of Meso- and Macro-plastics From Beaches of Long Island and Connecticut

Brian J. Doherty (SUNY Purchase, Purchase, NY) and George Kraemer (SUNY Purchase, Purchase, NY)

Abstract - Plastic debris in the oceans and on coastlines is of growing concern, with issues ranging from aesthetic to ecological. The objective of this research was to quantify meso- and macro-plastics in sediments collected from intertidal zones of 11 locations along the shores of Long Island and Connecticut. The sites were on the north and south sides of the Long Island Sound estuary, and ocean-facing beaches along the south shore of Long Island. At each site, we collected 15 cores of ~4000 cm^3 at 5 points along the wrack line or most recent high tide line of each beach. Sediment samples consisted of 0.067 mg plastic g^{-1} sediment at ocean beaches, 0.038 mg plastic g^{-1} sediments for Long Island Sound beaches, and 0.009 mg plastic g^{-1} sediments at Bay beaches. Plastics recovered from samples included; fragments of larger plastics, fibers, fishing line, beads, nurdles, and fragments of foam. Roughly 53%, by count, of the plastics found at ocean beaches were polystyrene. This fraction was larger still for Bays (69%) and Long Island Sound (75%). Knowing the most prevalent plastic pollutants on coastlines is needed in order to better assess the impacts of plastic pollution in the marine environment.

Sat- 49

Characterizing Northern Diamondback Terrapin Nest Site Selection with Respect to Vegetation in Southern New Jersey

Taylor Donovan (Monmouth University, West Long Branch, NJ) and Pedram Daneshgar (Monmouth University, West Long Branch, NJ)

Abstract - *Malaclemys terrapin terrapin* (Northern Diamondback Terrapin), a unique species found within estuarine systems of the Atlantic coast, have been listed as a species of concern in New Jersey due to evidence of decline. While several factors, both natural and anthropogenic, are to blame for these declines, nest-site degradation and loss may be the most detrimental to the success of future populations because of the strong nest-site fidelity exhibited by terrapins. Disturbances, land alteration, and the invasion of problematic species such as *Phragmites australis* (Common Reed) seem to be driving nest-site degradation, but definitive impacts to nest-site selection have yet to be explored. In this study, we investigated the plant communities associated with newly laid terrapin nests along the New Jersey coast in an attempt to characterize selection of nest sites. It was hypothesized that site alterations and plant invasions have made sites less suitable for nesting and for the success of future populations. At each nesting site, we surveyed the plant community and described the habitat in regard to disturbance and invasions. To determine the impacts of the plant community on nest temperature, we installed iButtons in each nest within 24 hours of the establishment of the nest. Results suggest that terrapins do not select sites based on the existing plant communities and that site fidelity rules selection. Additionally, plant community diversity was found to be significantly lower in plots where Common Reed was present. In nests with higher percent cover, average daily nest temperatures were cooler, which supports the idea that vegetation does influence nests. Identifying the effects of different parameters on nest conditions facilitates our understanding of how disturbance, land alteration, and invasion may impact future populations. Characterizing nesting habitat is an essential step in ensuring that Northern Diamondback Terrapin populations have adequate and appropriate space to sustain themselves for years to come.

Sat- 46

Documenting a Poorly Understood Alarm Call in the Northern House Wren

Benjamin Dookram (University of Massachusetts, Amherst, MA) and Paige S. Warren (University of Massachusetts, Amherst, MA)

Abstract - Even though a species is widely studied, we may still lack a significant understanding of many aspects of its behavior. *Troglodytes aedon* (House Wren) is a very common species that is present in many locations in which they coexist with humans. House Wrens tend to produce 2 main alarm calls during nesting, the lower amplitude call being only documented in the southern subspecies. This call sounds like a rolling gurgle (churr), and preliminary observations suggested that it is much less conspicuous than the other call. We took recordings of wren alarm calls from 17 locations throughout Massachusetts from June through August. We compared the acoustic structure of the "churr" call in the northern populations to published information on the southern House Wren subspecies. We found that the 2 regional versions of the call were largely similar, with a notable difference in the inter-note interval. We examined possible factors that may explain the function the call serves. None of these factors showed significant patterns. Our pilot data suggests that there may be a trend towards increased use of the call during incubation. Further studies should seek to test for and identify conditions under which the "churr" call is used during incubation in nesting House Wrens.

Sun- 2

Shelter Selection of Reproductive Female *Hemigrapsus sanguineus* in Southern New England

Mat Driscoll (Bridgewater State University, Bridgewater, MA) and Christopher P. Bloch (Bridgewater State University, Bridgewater, MA)

Abstract - *Hemigrapsus sanguineus* (Asian Shore Crab) is an invasive species that is common in cobble and boulder intertidal habitats on the coast of southern New England. Its success as an invader has been attributed to its competitiveness, environmental tolerance, and high reproductive output. Indeed, the Asian Shore Crab produces more eggs per brood (>50,000 for the largest females) than do resident crab species, with multiple broods per year. Brooding crabs may engage in behaviors that protect their egg masses from predation or unfavorable environmental conditions by, for example, congregating in appropriate shelters. The objective of this study was to test whether ovigerous female Asian Shore Crabs were associated with different habitat characteristics than other individuals. Although ovigerous females did not display a greater degree of spatial aggregation than males or non-brooding females, they were more strongly associated with larger rocks. This finding suggests that the availability of larger rocks for shelter during breeding may be a major component of habitat selection by the Asian Shore Crab, helping to explain its association with extensive rock cover.

Sat- 54

Ability of Detection Dogs to Discriminate Between Amphibian Species

Hannah M. Duffy (St. Lawrence University, Canton, NY) and Kristine Hoffmann (St. Lawrence University, Canton, NY)

Abstract - *Canis familiaris* (Domestic Dog) have always been renowned for their impressive scenting capabilities, and have been used for a variety of different detection jobs. More recently, dogs have been used in wildlife detection as a less invasive method of sampling species through locating scat or individuals. We aim to quantify the dogs' ability to differentiate between *Anaxyrus americanus* (American Toad) and other species when not directly trained to ignore other amphibians. Our results will inform future amphibian studies and refinement of this survey method. We will train the dogs to detect the toads using a scent box containing 4 mason jars. One mason jar holds the scent, and the dogs are rewarded only when they sniff the jar with the scent. In order to train the dogs to search and alert, we began clicker training the dogs using a cotton swab with birch oil on it, kept in a scent-proof box when not in use, and switched to cotton swabs with toad scent when the dogs were proficient at the task. Every time the dog sniffs the Mason jar with the toad swab, they are rewarded with a click, immediately followed with a treat. We will test the dogs to discriminate among toad species using *Anaxyrus fowleri* (Fowler's Toad) and others as distractors. We expect that dogs exposed to a single toad species during training will alert incorrectly on other toads more often than on frogs that are more distantly related.

Sat- 43

Translating Science into Practice and Practice into Science: Northeast RISCC Management Network

Emily J. Fusco (University of Massachusetts Amherst, Amherst, MA), Jenica Allen (University of New Hampshire, Durham, NH), Evelyn M. Beaury (University of Massachusetts, Amherst, MA; ebeaury@umass.edu), Bethany A. Bradley (University of Massachusetts, Amherst, MA), Michelle R. Jackson (University of Massachusetts, Amherst, MA), Brittany B. Laginhas (University of Massachusetts, Amherst, MA), and Toni Lyn Morelli (USGS, Amherst, MA)

Abstract - Translational invasion ecology is a new term for an old idea that managers and scientists need to work together to solve pressing problems about invasive species. Because the combined topics of invasive species and climate change represent a critical emerging challenge, the Northeast Regional Invasive Species and Climate Change (RISCC) Management Network addresses the question "How can we manage for upcoming biological invasions in the light of climate change?". The RISCC Management Network implements translational invasion ecology by identifying stakeholder needs, synthesizing existing research, developing new research and tools, and supporting increased collaboration among scientists and managers. To identify stakeholder needs, we surveyed nationally over 200 invasive species managers to assess barriers to management in the context of climate change. We have synthesized existing information through summaries of recent literature targeted at a general audience and by crafting 2-page "management challenge" documents that translate the state of the science, which are distributed to a listserv of 230 members. We are developing new research to prioritize range-shifting invasive species based on their impact, and new online tools to create state-level watch lists of range-shifting species. The RISCC Management Network has hosted 2 symposia to bring together scientists and managers to learn about these combined topics. Finally, we will use information gleaned from these conversations with managers to inform future research translation, implementation, and communication efforts. Join the RISCC Management Network by emailing ne_riscc-l-request@cornell.edu with the subject "join".

Sun- 33

Phenological Trends of Insect Diversity and Abundance in Acadia National Park: A Methods Study

Matthew Garafalo (SUNY Purcase, Purchase, NY) and Allyson Jackson (SUNY Purchase, Purchase, NY)

Abstract - Phenology, the timing of seasonal activities of organisms, is an important process for measuring ecological responses to climate change. While average global temperatures are steadily increasing, individual organisms, local populations, and even broader ecological communities do not respond to changes in global averages. Instead, they display variable responses based on regional heterogeneity, making monitoring changes in phenological trends difficult and labor-intensive. Given the observational nature of phenological studies, citizen science has proven to be effective in gathering spatially and temporally comprehensive data sets that have been useful for studying population dynamics and phenological trends over time. Citizen science projects provide participants with an insight as to how scientific studies are conducted, as well as expand their general scientific knowledge and literacy. We collected aquatic and terrestrial insects at 4 wetland sites within Acadia National Park, from 1 June 2018 to the 31 July 2018. We separated samples on the basis of collection method, source, and whether they were collected by technicians or by citizen scientists. Technicians followed strict quantitative sampling protocols, while citizen scientist sampling protocols were far more lenient. We sorted insects taxonomically and by size, and observed that samples collected by citizen scientists typically contained greater abundances of larger insects. Samples collected by technicians contained far less biomass overall, but were more representative of the invertebrate communities at each site.

Sun- 29

Invertebrate and Vertebrate Biodiversity in a Chronosequence of Forest Restoration

Langston X. Gash (Stevenson University, Owings Mills, MD) and Mark Norris (Stevenson University, Owings Mills, MD)

Abstract - Our objective was to explore and describe the development of animal communities along a chronosequence of forest restoration plots in order to evaluate the progression of reforestation efforts. We collected invertebrate samples using pitfall traps and flight-interception traps from 3 sites in each of 5 habitats consisting of meadow; 1-, 7-, and 15-year old forest seedling plantings; and a mature forest. The meadow hosted the greatest abundance of invertebrates, but the young reforestation plots (1- and 7-year old sites) had the most diversity, representing several more orders of invertebrates than the other habitats. Species composition varied somewhat as only 2 of the 12 orders identified were present across the entire chronosequence. Most orders were found in only 3 or fewer habitats. In conclusion, the invertebrate community appears to be responding to the restoration in agreement with the intermediate disturbance hypothesis in that the young reforestation sites contain the most diversity with organisms from both the meadow and forest habitats. These results suggest that the reforestation efforts are slowly shifting the natural communities from that of a meadow to that common in forests.

Sat- 24

Population Fluctuations in Dark-eyed Juncos in the Northeast

Jaret Gonzalez (Environmental Studies Department, Massachusetts College of Liberal Arts, North Adams, MA) and Daniel Shustack (Environmental Studies Department, Massachusetts College of Liberal Arts, North Adams, MA)

Abstract - *Junco hyemalis* (Dark-eyed Junco) is a small songbird found across much of North America during both breeding, migration, and overwintering periods. Since 2017, we have been trapping and banding juncos on the campus of the Massachusetts College of Liberal Arts in North Adams, MA. During the winter of 2017–2018, we captured 41 juncos over a 10-week period. However, during the 2018–2019 winter trapping season, we captured only 5 juncos over the same 10-week period. These low rates of capture mirrored results from weekly surveys for juncos in the surrounding neighborhood, further confirming a low abundance of juncos during the 2018–2019 winter season. The dramatic fluctuation in captures across winters led us to investigate junco population levels over a broader area and longer time periods in different seasons. We used several different data sources of population data on juncos including Christmas Bird Count, Project Feeder, Breeding Bird Survey (BBS), and eBird. These data sources cover different seasons and stages of the junco's annual cycle. In this presentation, we will describe our findings on junco populations from North Adams, MA, and the surrounding region.

Sun- 5

Stopover Habitat Quality in a Conserved Urban Riparian Zone in Rhode Island

Micaela M. Griffin (Salve Regina University, Newport, RI) and Jameson F. Chace (Salve Regina University, Newport, RI)

Abstract - Migratory birds spend critical time in stopover sites to rest and build energy reserves to continue their journey south. High quality stopover habitats provide birds with the opportunity for rapid net energy gain as measured by an increase in avian body mass index (BMI) relative to time since dawn, when foraging begins. In this study, we measured the BMI of fall migrants from 2012 to 2017 in an urban riparian conservation easement (Sweet Flag Preserve) in Middletown, RI. We captured birds at 9 different locations throughout the study site in mist nets, We released the birds right after we banded and quickly processed them after capture. Over the course of the study, 60 species were captured at an average rate of 93.4215 captures/100 net hours. The most common migrant species captured were *Geothlypis trichas* (Common Yellowthroat), a long-distance migrant species; and *Dumetella carolinensis* (Gray Catbird), *Melospiza georgiana* (Swamp Sparrow), *Melospiza melodia* (Song Sparrow), and *Zonotrichia albicollis* (White-throated Sparrow), short-distance migrant species. We observed a decrease in the BMI for all species as time progressed each day and over the course of the migratory season. All 3 sparrow species in this study saw varying degrees of a decrease in BMI as time since sunrise and as the migration season progressed. The Common Yellowthroat decreased in BMI as the migratory season progressed, but saw a slight increase in BMI as time since sunrise progressed. The Gray Catbird saw a slight increase in BMI as the time each day progressed and over the course of the migratory season. These results suggest the Sweet Flag Preserve is not a quality stopover habitat for migratory birds, and may be a stopover "trap" that provides safe resting place in dense shrubs of primarily invasive *Rosa multifora* (Multiflora Rose) among less common natives *Myrica* and *Viburnum*, but does not support the insect and berry abundance and quality that migrants require. Based on these results we provide recommendations to improve the quality of the urban riparian conservation easement.

Sun- 8

Influence of Environmental Variation on Epiphytic Bryophyte Assemblages on *Acer saccharum* (Sugar Maple) in Northern and Central New York

Steven J. Grunwald (SUNY ESF, Syracuse, NY) and Miguel Angel Garmendia Zapata (Universidad Nacional Agraria, Managua, Nicaragua),and Gregory McGee (SUNY ESF, Syracuse, NY)

Abstract - In past studies, we have identified the mesophytic mosses *Anomodon rugelii* and *Neckera pennata* as "large-tree" indicators in Adirondack northern hardwood forests, where these species occur with greater frequency and cover in old-growth stands. However, in forests of the Appalachian Plateau, these epiphytes do not occur on trees of equal sizes. Further, we have detected microenvironmental differences in temperature on tree surfaces between the Adirondack and Appalachian Plateau regions. Thus, it is not clear whether these species have been largely extirpated from central NY or whether growing conditions are unfavorable there. Therefore we established an ex/in situ transplant experiment of these epiphytes to test for differences in gametophyte survivorship and health between the Adirondack Highlands and the Alleghany Plateau. Vegetative mats were established in the Adirondacks and transplanted onto *Acer saccharum* (Sugar Maple) trees >50.0 cm DBH in 2 monitoring sites on the Alleghany Plateau. We detected no difference between regions in survivorship of transplanted mats, or in the health index of the transplants. Our preliminary data suggest that these species are capable of surviving in the Allegheny Plateau and thus past logging in the region may have removed host trees at a rate faster than these species can recolonize new substrates.

Sat- 17

Refueling Rates of Migratory Songbirds at Stopover Sites in the Connecticut River Valley

Mariamar Gutierrez Ramirez (University of Massachusetts Amherst, Amherst, MA), Sarah C. Deckel (University of Massachusetts Amherst, Amherst, MA), Alexander R. Gerson (University of Massachusetts Amherst, Amherst, MA), and David I. King (US Forest Service Northern Research Station, University of Massachusetts Amherst, Amherst, MA)

Abstract - Songbirds need stopover habitats along their autumn and spring migratory routes. Stopover habitats are the pit stops birds use to rest and restore their energy reserves as they travel to and from the breeding grounds. The quality and abundance of resources available to migrating birds at a stopover site can vary spatially and temporally. A particular stopover site may differentially concentrate species in terms of diversity, sex, and age groups between seasons, complicating the identification of important stopover sites for management or conservation. Assessing the quality of a stopover site can be facilitated by using a physiological approach, where circulating plasma triglycerides (TRIG) of the individuals using the site can be used to measure the extent that birds are replenishing fat reserves. We examined avian migration phenology and the refueling rate of passage migrant birds during autumn and spring migration at 2 stopover sites in the Connecticut River valley. We operated constant-effort mist-netting stations during autumn 2017 and spring 2018 at the Silvio O. Conte National Wildlife Refuge - Fort River Division and at the University of Massachusetts Amherst - Orchard Hill. All birds captured were identified to species, banded, aged, sexed, measured, and weighed. Additionally, we collected a small plasma sample from each bird by brachial venipuncture (<1% blood volume) for plasma metabolite analysis. We measured plasma TRIG, which in conjunction with body condition indices will allow us to compare refueling rate during spring and autumn migration across species, sex, and age classes in a number of common Northeastern migratory species: *Dumetella carolinensis* (Gray Catbird), *Setophaga coronata* (Yellow-rumped Warbler), *Zonotrichia albicollis* (White-throated Sparrow), *Hylocichla mustelina* (Wood Thrush), *Catharus ustulatus* (Swainson's Thrush), *C. guttatus* (Hermit Thrush), and *Parkesia noveboracensis* (Northern Waterthrush). These data will allow us to link habitat use to refueling rates and body composition to measurably determine stopover habitat quality and guide habitat planning and management.

Sun- 1

Stable Isotope Analysis to Compare the Trophic Overlap of Wood Thrush Nestlings in Continuous vs. Fragmented Forests

Anna Handte-Reinecker (Department of Biology, University of Massachusetts, Amherst, MA), Katherine (Kit) Straley (University of Massachusetts, Amherst, MA), Dr. Paige S. Warren (University of Massachusetts, Amherst, MA), Dr. Alexander R. Gerson (University of Massachusetts, Amherst, MA), and Dr. David I. King (USDA Forest Service, Amherst, MA)

Abstract - With rising urbanization rates around the world, ecosystems are being drastically altered. When faced with a constantly transforming ecosystem in a short evolutionary time frame, it is difficult for wildlife to evolve to be successful. Food availability for many species changes due to urbanization. For *Hylocichla mustelina* (Wood Thrush), food availability across different forested habitats varies, but it is unclear if the diets of nestlings are altered as a result. In order to answer this question, we compared the degree of trophic overlap between Wood Thrush nestlings in suburban forest fragments with nestlings in a contiguous forest in western Massachusetts. We analyzed feather samples from nestlings to determine their $\delta^{13}C$ and $\delta^{15}N$ stable isotope ratios, which were then used to identify the degree of trophic overlap. We will use these data to compare trophic structure in order to test for distinctions between the diets of the 2 populations. The 2 tested environments contain varying ratios of known Wood Thrush diet components such as insects and other arthropods. For this reason, we predict that that the 2 populations will have distinct C and N signals. If the C and N signals were to overlap, it would suggest that Wood Thrush have adapted to eat similar diets regardless of prey availability by changing their foraging habits. By understanding the trophic overlap of different populations of Wood Thrush, we hope to determine potential fitness effects of urbanization on this declining species and their behavioral responses.

Sun- 3

Comparing Contemporary to Historical Fluctuating Asymmetry in Plastron Scutes of Wood Turtles

Hannah C. Harby (SUNY Oneonta, Oneonta, NY), Amanda Rhodes (SUNY Oneonta, Oneonta, NY), Alexandra Vlk (SUNY Oneonta, Oneonta, NY), and Elizabeth Bastiaans (SUNY Oneonta, Oneonta, NY)

Abstract - Fluctuating asymmetry in bilaterally symmetric organisms may be linked to the instability of a species, possibly playing a role in *Glyptemys insculpta* (Wood Turtle) declining populations. Using the software ImageJ and data previously collected on historical Wood Turtles in the Oneonta area, I measured modern day specimens ($n = 42$) to compare plastron scute area. Projected results include a difference in total scute area of turtles between those in the historical data set and those in the recent data set, indicating contemporary Wood Turtles to have a higher percentage of fluctuating asymmetry. Comparative results may designate a relationship of inbreeding within the species, which would further decrease the population due to insufficient genetic variation.

Sun- 41

Assessing the Role of Avian Seed Dispersal in the Spread of Invasive *Lonicera* Seeds

Phoebe Hartvigsen (SUNY Geneseo, Geneseo, NY), Kiersten Coates (SUNY Geneseo, Geneseo, NY), and Suann Yang (SUNY Geneseo, Geneseo, NY)

Abstract - Invasive plant species use a variety of ecological tactics in order to spread through an ecosystem and often drastically change the vegetative landscape. These changes alter the fruiting phenology of the area and therefore affect animal species such as pollinators and frugivores. Some plants utilize frugivores such as birds to enable more efficient dispersal of their seeds, which allow these plants to colonize a wider range with more viable seeds due to scarification provided by the birds' digestive enzymes. Our study took place in a 8-ha (20-acre) secondary successional forest in western New York. We collected data by walking along a set transect each week and collecting seeds from avian feces and regurgitation for the duration of the summer and fall of 2018. These data aided in our understanding of the role that birds play in the spread of the invasive species *Lonicera maackii* (Amur Honeysuckle) and *Lonicera morrowii* (Morrow's Honeysuckle). Our results indicate that birds do not preferentially spread invasive plant species but suggest that Amur Honeysuckle seeds may possess inhibitory chemicals that would reduce the viability of co-dispersed native seeds.

Sat- 32

Hatchling Size, Brumation Activity, and In-water Behavior in a Population of Northern Diamondback Terrapin

Sarah Helmbrecht (Barrington Land Conservation Trust; Barrington, RI)

Abstract - *Malaclemys terrapin terrapin* (Northern Diamondback Terrapin) nesting activity is monitored and nests are protected as part of a long-term nesting population study and conservation project conducted using volunteers and organized by the Barrington Land Conservation Trust. Hatchlings emerging from protected nests are typically moved from the nesting habitat to areas of vegetation sloping towards the adjacent cove. Hatchlings emerging from unprotected nests during late summer and early autumn typically move to the nearest vegetated area to the upland nesting site to brumate. Hatchlings may also remain in the nest until the following spring. Surveys of hatchling Northern Diamondback Terrapins were conducted in 2018 during spring emergence and following the summer nesting season. Hatchlings emerged from brumation during the spring from both the upland nesting habitat and near the edge of the cove. A test of standard deviation from the mean of hatchling sizes indicated that hatchlings overwintering adjacent to the marsh and cove may feed and grow over the winter, rather than fully brumating. The potential difference in brumation location as a factor of behavior, as well as the overlap of hatchling emergence in upland habitat with the beginning of nesting season, have implications for habitat management activities. Surveys of Northern Diamondback Terrapins in the water during nesting season documented a variety of life stages, concurrent with surveys of other regional populations of the species. Nesting females engaged in behavior at the surface of the water that could be due to the use of chemoreception. This observed behavior provides an interesting direction for future investigations.

Sat- 45

Fruiting Phenology in Migratory Stopover Habitat in an Urban Riparian Zone

Tyler Hertzwig (Salve Regina University, Newport, RI) and Jameson F. Chace (Salve Regina University, Newport, RI)

Abstract - Many bird species use stopover habitats to rest and refuel for their on their southward annual migration. Urban riparian corridors are often protected to provide for recreational trails, maintain water quality, and/or provide wildlife habitat. Over a 7-year period (2012–2018), we examined autumn migratory bird use of an urban riparian zone in Middletown, RI, that has been conserved for drinking water protection. During the study a total of 25 species were captured with a total of 82 captures per 100 net hours during the 2018 fall study. During the fall of 2018, we examined the fruiting phenology of 25 shrubs of *Rosa multiflora* (Multiflora Rose; $n = 10$), *Myrica pensylvanica* (Northern Bayberry; $n = 2$), *Viburnum dentatum* (Arrowwood Viburnum; $n = 7$), and *Vaccinium ovatum* (Huckleberry; $n = 1$). The peak ripeness of Northern Bayberry (between 6 and 20 Sep) correlated with the peak of *Dumetella carolinensis* (Gray Catbird) captures, one of the most common migrants. The peak ripeness of Multiflora Rose berries (25 Oct. to 1 Nov.) correlated with the peak of total captures that year. Based on the 2018 results, the peak abundance of migrants during stopover coincided with peak of berry production, for both natives and nonnative species. As nonnative shrubs slowly replace native species, berry phenology changes in terms of species composition and an abundance of berries that ripen later in the season. Late-season, nonnative berries may not coincide with the passage of most migrants through the stopover habitat.

Sun- 6

Correlation of Average Winter Temperatures with Abundance of the Asian Shore Crab

Nicole M. Huff (Bridgewater State University, Bridgewater, MA) and Christopher P. Bloch (Bridgewater State University, Bridgewater, MA)

Abstract - *Hemigrapsus sanguineus* (Asian Shore Crab) is an invasive species that is common in rocky intertidal habitats on the coast of New England. The northern extent of its invaded geographic range appears to be limited by temperature. As a result of climate change, polar vortex conditions are likely to become more frequent, leading to a greater likelihood of extreme winter weather. The objective of this study was to test for an association between Asian Shore Crab abundance and winter temperatures, to establish a baseline for comparison to long-term observations. We estimated abundance of the Asian Shore Crab at 11 cobble and boulder beach sites over a 5-year span in Massachusetts and Rhode Island, and at 1 site on Cape Cod for 15 years. We predicted Asian Shore Crabs would have a smaller mean abundance at a given site following a colder winter. From 2014 to 2018, the 11 sites did not show any consistent significant correlation between average abundance of the Asian Shore Crab and mean winter temperature (December to March). However, this result may be a function of the short-term nature of the data. From 2003 to 2018 at Sandwich, MA, average abundance of the Asian Shore Crab was significantly positively associated with mean winter temperature. In particular, there were large declines in abundance associated with the coldest winters. Additional long-term data from multiple sites will be useful to determine the generality of this pattern.

Sat- 52

Rare Saproxylic Hover Flies (Diptera: Syrphidae) Inhabiting Old-growth Forests of New YorkState: One Component of the Empire State Native Pollinator Survey

Zachary R. Jacobson (SUNY Cobleskill, Cobleskill, NY), Carmen Greenwood (SUNY Cobleskill, Cobleskill, NY), Jeff Corser (New York Natural Heritage Program, Albany, NY), Erin White (New York Natural Heritage Program, Albany, NY), and Matthew Schlesinger (New York Natural Heritage Program, Albany, NY)

Abstract - Native pollinators play a critical role in supporting plant biodiversity and ecosystem function. While bees are widely recognized in this role, flies are likely the second-most important group, with at least 70 families worldwide known to be important pollinators. Containing over 800 species, the family Syrphidae is one of the most diverse and prolific pollinating taxa. This study focused on assessing the status of 80–100 target species of potentially endangered status, contained in 25 genera of Syrphidae that are saproxylics. Because these saproxylic flies breed in declining old-growth forests, the status of these taxa is uncertain and may be in jeopardy of decline due to deforestation. We pre-selected potential sampling sites, consisting of a variety of old-growth forest habitat types which often occur at high elevations conducive to the hilltopping behavior of the target taxa. I conducted sampling in 2018 from May to August using targeted sweeps and Malaise-trap sampling throughout 6 locations within the St. Lawrence Valley, Catskills, and Adirondacks. Over 500 Syrphidae were identified and 1000 enumerated. This preliminary study yielded 65 target species in 8 different genera and several were new state and county records. The presence of these species in old-growth forests reinforces the need to conserve this rare habitat type. Our goal is to survey as many old-growth forests throughout New York State as possible within our 4-year sampling effort. This survey is one component of the larger Empire State Native Pollinator Survey effort.

Sat- 5

Cardiac Response of *Carcinus maenas* and *Cancer irroratus* under Acute Hypoxia Exposure

Sierra L. James (Maine Maritime Academy, Castine, ME)

Abstract - Natural and anthropogenic sources of limiting nutrients paired with increasing duration and temperature of the summer season in Maine have contributed to a rise in documented hypoxia. Decapod crustaceans are negatively affected by coastal hypoxia from reduced physiological adaptations which may be species specific in crabs. In a laboratory setting, I surgically implanced wires beneath the carapce of *Cancer irroratus* (Atlantic Rock Crab) and *Carcinus maenas* (European Green Crab) speciments. I connected crabs to electrodes that measured heart rate, and exposed them to a control normoxic, hypoxic and recovering normoxic treatment. Heart rates of individual crab species significantly differed when exposed to hypoxic oxygen concentrations. Under hypoxia treatments, Rock Crabs were more negatively affected compared to Green Crabs, suggesting that Green Crabs may have better physiological adaptations to deal with lowered oxygen concentrations than Rock Crabs. One such adaptation is the cardioarterial hemolymph regulation within the decapod crustacean body that may increase flow to the appendages, increasing the crab's ability to move away from hypoxic regions. Changes in coastal Maine benthic ecosystems may occur when mobile organisms flee hypoxic conditions, increasing the potential for a change in food webs.

Sun- 52

An Investigation of the Sedimentary Environments of Smith Cove and Nautilus Cove, Maine

Sally A. Jarmusz (Maine Maritime Academy, Castine, ME)

Abstract - Seafloor mapping consists of using types of sonar, such as side scan sonar, to create an accurate depiction of seafloor features. Seafloor mapping provides crucial information about potential navigational hazards, changes in geological formations, and opportunities for aquaculture development. Sedimentary environment maps are a type of seafloor map that assists with revealing this information. These maps rely on sonar imagery and sediment samples to provide crucial information on seafloor sediment types to mariners, scientists, and local communities. While sonar mapping has been done in Smith Cove and Nautilus Cove, ME, the mapping was both incomplete and lacked enough detail to be useful to these communities. Therefore, the objective of this study was to create a detailed sedimentary environment map depicting the sediment types of Smith Cove and Nautilus Cove. I used side scan sonar to obtain sonar imagery of these areas and collected sediment samples to ground truth and add more detail to this imagery. I used classification schemes developed by Barnhardt et al. and Folk to identify different sediment types in these survey areas, and GoogleEarth Pro to incorporate the resulting sediment types into a map depicting the sedimentary environments of these survey. Overall, I found that coarser sediments were closer to the entrance of the coves, while mud was primarily in the center of the coves and dominated the survey areas. These patterns are most likely due to the current and tidal movements of the survey region. However, there is more research that can be done to enhance the details of this map and add more information about these sedimentary environments.

Sun- 54

Patterns of Plant Invasion at Multiple Scales in Three Forested Natural Areas

Chad C. Jones (Connecticut College, New London, CT) and Asa Peters (Connecticut College, New London, CT)

Abstract - Intact forests have long been thought to be resistant to invasion by exotic plant species. However, evidence has mounted in recent years that some plant species are able to invade even undisturbed forest. However, not all areas of undisturbed forests are invaded, and questions remain about what forest characteristics may enable or prevent successful invasion. Forest age, landscape position, soil characteristics and land-use history are all factors that may influence the degree to which forests are invasible, and different factors may be important at different spatial scales. In this study, we sampled the distribution of invasive species within 3 large natural areas in southeastern Connecticut and compared the distribution with a range of factors including forest age, basal area, distance to forest edge, and distance to nearest road or trail. We also collected soils from paired plots with and without invasive species and analyzed organic matter content, pH, water content and nutrient levels. Results were similar among all sites. Within sites, invasion was highest in younger forests, but did not vary with forest basal area. Invasion was also higher closer to roads, trails, and forest edges. Paired plots showed higher invasion in areas with higher soil nutrient levels over small distances. However, younger forests (which were more invaded) had lower overall nutrient levels. Thus, soil nutrient levels may impact invasion at small scales, but are not likely the primary drivers of the effect of forest age on larger-scale patterns in this area. Understanding the factors that influence the invasibilty of forested natural areas at a variety of scales is critical for monitoring and management of invasions in these areas.

Sat- 23

A Paleoecological Survey of Salt Marsh Sediments in the Bagaduce River, Maine

Brendan Kerivan (Maine Maritime Academy, Castine ME)

Abstract - High rates of salt marsh accretion leads to the rapid preservation of ecological indicators such as pollens and microcharcoals in the sediments. As these indicators are buried, they act as natural documentation of the ecological conditions at the time of their deposition. The objective of this study was to determine how pollen genera and microcharcoals changed over salt marsh sediment depth. This was done by collecting marsh cores and subsampling 5 different depths within them. Samples were processed through the University of Maine's standard HF palynology separation protocol, an adapted form of the standard devleoped by Faegri et al., then counted under a microscope. Pollen counts were found to be outside the expected distribution (χ^2) and highly variable, while charcoals were shown to increase with depth. Some pollen genera were absent completely, whereas others were observed at a higher than average frequency; however, several trends were seen in some pollens such as *Betula* spp.. Further study of sediments in this area would no doubt reveal more about its ecological history.

Sun- 56

Genetics of Maine's Freshwater Snails

Alexander Kimball (University of Maine at Presque Isle, Presque Isle, ME, Kenneth Hotopp (Appalachian Conservation Biology, Bethel, ME), Derek Yorks (Inland Fisheries and Wildlife, State of Maine, Bangor, ME) and Judith L. Roe (University of Maine at Presque Isle, Presque Isle, ME)

Abstract- With 40 plus nominal species in Maine alone, freshwater snails are important to the ecology of lakes, ponds, rivers, and streams. Late 19th- and early 20th-century naturalists described 2 rare species of snails that may be unique to Maine, *Stagnicola mighelsi* (W.G. Binney, 1865) and *S. oronoensis* (F.C Baker, 1904). We conducted surveys to inventory snail populations in northern Maine and compare them to records published by Olaf Nylander in the early 1900s. We collected snails belonging to these 2 nominal species from freshwater lakes in Maine and extracted samples of DNA from them. We analyzed the DNA sequences at 4 separate gene regions, nuclear genes ITS1 and ITS2 and mitochondrial genes COI and 16s rRNA to determine their genetic relationship to 2 wide-ranging Northeastern species (*S. elodes, S. catascopium*). All the comparisons show high conservation, but unique sequences are found for each. We also catalogued specimens from the Norton Collection at University of Maine at Presque Isle that included several of these species collected from 1954 to 1962 by Leroy Norton. This study adds new site locations to earlier observations and widens the known distribution of freshwater snail species within Maine.

Sat- 38

Assessing Impact of Dam Removal on Length Frequency Distribution of *Anguilla rostrata* (American Eel) in the Mill and Town Rivers

Samantha King (Bridgewater State University, Bridgewater, MA), **Rianna Tamulynas** (Bridgewater State University, Bridgewater, MA), Patrick McKenna (Bridgewater State University, Bridgewater, MA) Christine AuCoin (Bridgewater State University, Bridgewater, MA), and Kevin D. Curry (Bridgewater State University, Bridgewater, MA)

Abstract - *Anguilla rostrata* (American Eel) is a catadromous fish listed as endangered on the ICUN red list, though not currently listed as endangered by the US Fish and Wildlife Service. Larger American eels have difficulty migrating upstream due to stream barriers like dams that contribute to the decrease of the eel population. We compared length-frequency distributions and average total lengths of elvers and yellow eels above and below the Reed and Barton Dam before and after dam removal (Fall 2017 and 2018) on the Mill River in Taunton, MA. We considered eels <200 mm to be elvers, and PIT-tagged only yellow eels (>200 mm). Fall 2018 data for total length for eels that we collected from the Town River in West Bridgewater at War Memorial Park and Bridgewater at Stanley Iron Works, MA, near to a dam for which removal has been proposed, suggests an early fall downstream movement of larger yellow eels in Fall of 2018. Seasonal comparison of average total lengths of eels between Fall 2017 and 2018 revealed average total length of yellow-phase eels was larger downstream of the Reed and Barton Dam at Taunton State Hospital in Fall 2017. Average total length of yellow-phased eels increased upstream after the removal of the Reed and Barton Dam at Whittenton Mills in Fall 2018.

Sat- 34

Learning Field Ecology and Natural History through Ecological Inventories: The View From Mrs. Mayo's Farm I

Aya Kumagai (Island Research Center, College of the Atlantic Bar Harbor ME), **Katya Khadonova** (Island Research Center College of the Atlantic Bar Harbor ME), and John G.T. Anderson (Island Research Center College of the Atlantic Bar Harbor ME)

Abstract - In 1966, noted Harvard Ecologist Hugh Raup published an article entitled *The View From John Sanderson's Farm: A Perspective for the Use of the Land.* Raup's paper described the historical and natural historical background for the Harvard Forest in Petersha, MA, and also serves as a useful blueprint for studies elsewhere. In the fall of 2018, we approached the Maine Coast Heritage Trust with a proposal to conduct an ecological inventory of the Blue Horizons Preserve, a 28-ha (70-acre) former dairy farm that had been abandoned in the late 19th century and donated to the Trust in the early 21st century. The purpose of the project was two-fold: to provide baseline data that the Trust could use in management decisions and to provide opportunities for undergraduate students to learn appropriate techniques and analyses in field ecology and Natural History. In December of 2018, we mapped the study site using a Trimble GEOXT differentially corrected GPS accurate to 0.5m. We entered data into a GIS (ESRI ARC MAP 10, including roads and trails, streams, ponds, and human artifacts such as wells, foundations, and stone walls. Game cameras were deployed throughout the property to catalog large mammals and were also placed near access points to provide insight on the nature and current level of human use. We also surveyed antique maps of the region and historical records in town archives in order to determine past land use. The resulting database lays the groundwork for future studies including assessing most-favored habitat by large mammals and cavity-nesting birds and the impact of humans and their dogs on land use by other species. The study also demonstrates the importance of hands-on learning in developing the next generation of natural historians.

Sat- 58

Effects of Prey Abundance on Egg Production of the Asian Shore Crab

Sarah Kuyateh (Bridgewater State University, Bridgewater, MA), Alexis Correira (Bridgewater State University, Bridgewater, MA), Mathew Driscoll (Bridgewater State University, Bridgewater, MA), and Christopher P. Bloch (Bridgewater State University, Bridgewater, MA)

Abstract - *Hemigrapsus sanguineus* (Asian Shore Crab) is an invasive omnivore that is common on rocky shores of New England. Since its introduction, it has caused severe declines in several species of prey and competitors. Animal prey are more energetically profitable than algae, suggesting that when animal prey are plentiful, the Asian Shore Crab may exhibit increased survivorship and reproductive success. However, effects of prey abundance on fecundity have not yet been demonstrated in the field. Alternatively, geographic variation in fecundity may be driven largely by environmental conditions such as temperature. The objective of this study was to test whether prey availability or other environmental factors best explained fecundity of the Asian Shore Crab in southern New England. In summer of 2018, we collected gravid female crabs from 9 cobble and boulder beaches in Massachusetts and Rhode Island. Larger females, on average, produced more eggs per clutch than smaller females, but average fecundity varied considerably among sites. Mean fecundity correlated positively with availability of invertebrate prey (i.e., prey abundance per crab), but not with habitat characteristics (e.g., rock cover, algal cover, rock size) or latitude, a surrogate for temperature. These results support the hypothesis that invasive species that are efficient predators can limit their own population growth by depleting preferred prey.

Sat- 55

Rifts, Reefs, and Riparian Wetlands: Historical Ecology of Seneca, Oneida, and Oswego Rivers

Catherine Landis (SUNY ESF, Syracuse, NY)

Abstract - The Oswego River watershed, part of the Lake Ontario watershed, once supported one of the most productive inland fisheries on the East coast of North America. Besides fish, plant communities here included cedar)swamps as well as riparian habitats with *Zizania*(wild rice), *Typha* (cattails), *Acorus calamus*(Sweet Flag), and other wetland species. The human relationship to this region appears to be continuous and enduring: archaeological sites along these rivers reveal thousands of years of occupation, with deep middens. This project, in its early stages, aims to document the historical ecology of 3 main rivers in the Oswego River watershed—the Oneida and Seneca, which unite to form the Oswego flowing into Lake Ontario. The project focus is on the mainstem rivers, their fisheries, and riparian plant communities. The project also aims to illuminate, to the extent feasible, the human relationships affecting these ecosystems over the past 5000 years including Indigenous science and cultural mores that apparently maintained ecological integrity over the long term. In addition, I will review Euro-American worldview and impacts following colonization. The provisioning value of these systems has plummeted in the past 200 years due to dredging, canalization, development, and pollution. Today the main value of these rivers is for waste conveyance, transportation (as part of the NY State barge canal system), power generation, and recreation. Fish advisories limit consumption, especially close to the outlet of a major Superfund site, Onondaga Lake. Yet, much riverine forest remains, and water quality has improved in the past 20 years. Such a historical perspective is critical to guide and inspire ecocultural restoration of this system.

Sat- 36

Evaluating the Trapping Efficacy of Spotted Turtles (*Clemmys guttata*)

Kathryn Lauer (Antioch University New England, Keene, NH) and Lisabeth Willey (Antioch University New England, Keene, NH)

Abstract - Turtles are among the most threatened group of vertebrates in the world. The freshwater turtle family Emydidae is especially vulnerable to extinction in North America due to multiple anthropogenic threats including habitat loss, habitat degradation, road mortality, and poaching. Currently, very little is known about the status of *Clemmys guttata* (Spotted Turtle) across its range. The Spotted Turtle is a small, cryptic turtle which resides in shallow, heavily vegetated wetlands. Because of these life-history characteristics, it can be difficult for researchers to trap effectively for Spotted Turtles. It is important for monitoring purposes to understand the optimal conditions under which trapping should occur to effectively understand site presence and population sizes. This study analyzed results from standardized trapping events in Maine, New Hampshire, Massachusetts, Pennsylvania, Delaware, Maryland, Virginia, West Virginia, Georgia, and Florida in 2018. We evaluated variation in rates of capture of Spotted Turtles with respect to ordinal date, water and air temperature, and other weather parameters during the survey period to estimate optional conditions for trapping throughout the region. This analysis will inform further trapping events conducted over the next 2 years. The next step for this analysis is to determine which landscape covariates best predict Spotted Turtle abundance, which can be used to further our understanding and the conservation needs of this vulnerable and elusive species.

Sun- 43

Parasitology of Adirondack Fish

Jacob T. LaVarnway (SUNY Plattsburgh, Plattsburgh, NY), Mya Stone (SUNY Plattsburgh, Plattsburgh, NY), Adelena Sackett (SUNY Plattsburgh, Plattsburgh, NY), and Dr. Alyssa Gleischner (SUNY Plattsburgh, Plattsburgh, NY)

Abstract - Fish are host to a variety of parasites, which cause disease and can sometimes pose a threat to humans through consumption of raw or undercooked fish. Probability of infection in fish can vary based on the species of fish as well as that fish's characteristics. The primary purpose of this research was to test whether fish that are larger in size are more likely to be infected with parasites. We predicted that larger fish would have higher parasite prevalence, as fish size is correlated with age, and older fish have had more time to accumulate parasitic infections. A secondary goal of this study was to conduct a survey of parasites in the overall fish population of Lake Champlain, a historically under-studied population. The data collected has been compiled from *Lepomis macrochirus* (Bluegill), bass, perch, and *Lepomis gibbosus* (Pumpkinseed) from Lake Champlain. We conducted a full-body external exam as well as an internal examination of muscle tissue and completed a gross necropsy examination and sectioning of intestinal tracts into 3–4 segments (8 cm each) to screen for parasitic infections. Preliminary results showed that parasites were more commonly found in the fish that were, on average, longer in body and tail lengths. We also report on the types of parasites found within the Lake Champlain population.

Sun- 45

A Tale of Two Trees: How Climate Change is Affecting Growth Trends of *Pinus banksiana* and *Pinus rigida* at Opposing Range Margins

Linh Le (SUNY Plattsburgh, Plattsburgh, NY), Mark Lesser (SUNY Plattsburgh, Plattsburgh, NY), and Michael Hurban (SUNY Plattsburgh, Plattsburgh, NY)

Abstract - Species range margins may indicate climatic niche limits that a species cannot grow beyond. At their range margin, species may not be in their ideal, or optimized, conditions for survival, growth, and/or reproduction. With ongoing climate change, conditions at a range margin may be becoming more or less suitable for a species depending on the geographic position of the margin (i.e., north vs. south). To study how species are dealing with climate change at their range margins, we will assess annual growth trends in 2 long-lived tree species, *Pinus banksiana* (Jack Pine) and *Pinus rigida* (Pitch Pine). These 2 species have opposing latitudinal range margins where they co-occur at the Altona Flatrock pine barren in northern New York State. Jack Pine is at its southern-most limit in North America at this site, while Pitch Pine is at its northern-most limit. We hypothesized that with warming climate, environmental conditions may be becoming too warm for Jack Pine at its southern limit, while Pitch Pine will potentially thrive with warming temperatures at its northern margin. Increment cores taken from the trunks of 65 Jack Pine and 32 Pitch Pine at the Altona site have been measured using standard dendrochronological techniques. Preliminary results suggest that Jack Pine growth has been steadily decreasing over the past ~50 years, while Pitch Pine growth has been increasing over the same time frame. Prior to the 1960s, growth in Jack Pine was much higher than Pitch Pine; however, Pitch Pine growth had surpassed that of Jack Pine by the 1990s. Further analysis, including crossdating and detrending, will verify and strengthen these preliminary findings. We will also model annual ring-width against a suite of regional climate variables to determine what factors each species is responding to over time. 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- 19

Effects of Reforestation Efforts on Forest Development and Abiotic Factors across a Restoration Chronosequence

Ashton D. Leschke (Stevenson University, Owings Mills, MD) and Mark D. Norris (Stevenson University, Owings Mills, MD)

Abstract - The goal of this project was to determine the effect reforestation has had on forest development and abiotic factors at Irvine Nature Center (Owings Mills, MD). Restoration efforts here consisted of planting tree seedlings 1, 7, and 15 years ago in order to expand forest habitat, returning land to its native state. Abiotic factors studied include air temperature, soil moisture, and soil organic matter (SOM) in these restored areas as compared to in meadow and mature forest. Forest development characteristics included the size of trees and leaf-litter accumulation. Abiotic factors showed little variation across the chronosequence and no correlation to habitat. These factors may need more time to develop differences or perhaps would exhibit differences if re-evaluated at different times of the year. Tree development showed that the number and size of trees were approaching that of the mature forest. Tree leaf-litter accumulation increased over the chronosequence, while graminoid litter decreased. It appeared as if these restoration efforts were slowly satisfying the goals of increasing forest habitat, but forest development is a slow process and it may take decades for the abiotic environment to represent a mature forest.

Sun- 16

A Survey of Microplastic Pollution from Wastewater Treatment Plant Effluent Within the Lake Champlain Basin

Lucas Le Tarte (SUNY Plattsburgh, Plattsburgh, NY), Nathanial McCauley (SUNY Plattsburgh, Plattsburgh, NY, Melissa Moriarty (SUNY Plattsburgh, Plattsburgh, NY), Erin Lee (SUNY Plattsburgh, Plattsburgh, NY), Brandon Buksa (SUNY Plattsburgh, Plattsburgh, NY), Thomas Niekrewicz (SUNY Plattsburgh, Plattsburgh, NY), and Danielle Garneau (SUNY Plattsburgh, Plattsburgh, NY)

Abstract - Microplastics are an emerging and ubiquitous pollutant. Recent studies suggest that consumer-care products and laundering of synthetic garments are major sources of microplastics. Most current wastewater treatment plant (WWTP) technologies are limited in their ability to remove particulates <5 mm in size and pose a threat to aquatic organisms. Since 2013, we have been surveying WWTP post-treatment effluent samples with the city of Plattsburgh, NY (*n* = 61). In 2016 we started sampling in St Albans, VT (*n* = 64), Ticonderoga, NY (*n* = 42), and Burlington, VT (*n* = 21), and added Vergennes, VT (*n* = 20), to our survey in 2017. Post-treatment effluent samples derive from 24-hour plant sampling events and were processed using wet peroxide oxidation methods. We characterized all samples based on the type of microplastic (e.g., fragment, fiber, pellet, film, foam), size, and color, as well as polymer type using Fourier Transform Infrared Spectroscopy (FTIR). Plant-specific characterization revealed fibers were the most common microplastic in Vergennes (55%) and Ticonderoga (39%), as compared to foam (52%) in St. Albans, fragments (43%) in Plattsburgh, and similar proportions of fragment and films (31%) in Burlington. Estimated output of microplastic particles per day were: Plattsburgh (*n* = 14,972), St. Albans (*n* = 28,620), Burlington (*n* = 19,806), Ticonderoga (*n* = 10,544), and Vergennes (*n* = 576). Additionally, polymer type varied by plant and included HDPE, PVA, and styrene. Differences likely reflect plant characteristics; for example, Plattsburgh and Burlington serve a similar sized population and have a similar capacity, so the difference in particle abundances may be due to varied infrastructure updates. In addition, St. Albans and Vergennes have tertiary treatment; however, dates of recent upgrades vary. Microplastic pollution is a concern when we account for the 24-flow rate from treatment plants and lakewide distribution. Microplastics have the potential to adsorb harmful chemicals residing in the water and pose risks to aquatic organisms and human health. By documenting wastewater treatment plants as a source of microplastics, we can share these findings with plant operators, lake stewards, government officials, and work towards solutions both up and downstream.

Sun- 47

No Leaf Eft Behind

Dayna M. Levine (Skidmore College, Saratoga Springs, NY) and Joshua H. Ness (Skidmore College, Saratoga Springs, NY)

Abstract - Leaf-litter habitat can provide woodland amphibians with moisture, shelter from predation, and opportunities for foraging. Here, we evaluate the distribution of juvenile *Notophthalmus viridescens* (Red-spotted Newt; efts) within a 60-ha *Acer* (maple)–*Quercus* (oak) woodland in relation to the standing biomass of senesced leaf litter and characterize spatiotemporal variation in that aboveground, senesced biomass. We quantified sightings of aboveground efts across 228 quadrats of 100 m^2 each in Sept 2018 and collected dry leaf biomass in 118 quadrats of 0.09 m^2 each along the same areas at that time. We assigned auadrats for efts and leaves to larger 2.1-ha regions (130 m x160 m) and used the average values within each of 16 regions as replicates for the purpose of comparisons. The relationship between eft sightings and litter was not linear. Rather, efts were rarely sighted in regions with less leaf litter (average SE = 0.21 0.14 sightings where litter was 140–176 g m^{-2}), and indistinguishably higher in regions with intermediate and high amounts of leaf litter (average SE = 0.89 0.25 and 0.86 0.24 sightings in regions with 200–300 g m^{-2} and 300 g m^{-2}, respectively). Based on these results, a threshold concentration of aboveground leaf litter seems a necessary precondition for activity by efts. We attribute the among-region differences in standing leaf litter within the forest to spatial variation in litter-decomposition rates; among-site variation in standing leaf litter increases from April to October (CV = 0.31 and 0.57) even as the biomass of falling leaves is similar among regions (CV = 0.15). The next research project will explore whether the relationship between amphibians and leaf litter is mediated by earthworms.

Sat- 42

Cortex Degeneration Contributes to Leaf Prostration of the Wintergreen Fern *Polystichum acrostichoides*

Dimitri Lockhart (SUNY Oswego, Oswego, NY), Jinyan Guo (SUNY Oswego, Oswego, NY), and Jack Tessier (SUNY Delhi, Delhi, NY)

Abstract - *Polystichum acrostichoides* (Christmas Fern) is one of the wintergreen ferns that maintain their leaves through the winter by prostrating under the snow. During leaf prostration in the early winter, the proximal region of the petiole (stipe) of the leaf (frond) forms a hinge, which makes the leaf tilt to its abaxial (lower) side, and the leaf is eventually laid on its abaxial surface by the snow. We investigated the anatomical changes that enable the formation of the hinge on the petiole by sampling petioles of leaves of 3 different sizes in the same clone and sectioning through the distal region through the hinge region and to the proximal region of the petiole using a microtome to cut wax-embedded tissues and light microscopy to observe the anatomical changes between the hinge region and the normal region of the petiole. This study showed that for all leaves of different sizes, the vascular bundles are intact at all regions of the petiole, whereas the cortex is mostly to completely degenerated only at the hinge region. For young leaves, the multiple hypodermis is intact at all regions, and the 2 abaxial vascular bundles are significantly smaller than the 2 adaxial bundles; the degeneration of the cortex cells causes an indentation between the 2 rows of small and big vascular bundles at the hinge region with the indentation closer to the abaxial side causing the leaf to tilt to the abaxial side. For older leaves, the multiple hypodermis is degenerated as scales, while the cortex cells, though having thick cell walls, are degenerated at most of the hinge region causing the 2 big vascular bundles and 3 small bundles to arrange in 1 row in the compressed cortex; at the proximal end of the hinge region, only a group of cortex cells that are next to the adaxial side of the big vascular bundles are intact and their presence may provide more mechanical support to the adaxial side causing the leaf to tilt to the abaxial side. This study demonstrated that different leaves in the same clone use different anatomical mechanisms for leaf prostration.

Sun- 36

An Enhanced Biodiversity Blitz Model for Natural History Education at Black Rock Forest, NY

Terryanne Maenza-Gmelch (Barnard College Environmental Science, NY, NY), Angelica Patterson (Columbia University Earth and Environmental Sciences, NY, NY), Melissa A. Wright (Columbia University Center for Teaching and Learning, NY, NY), Peter L. Gmelch (NYU Environmental Conservation Education, NY, NY), and William Schuster (Black Rock Forest, Cornwall, NY)

Abstract - A week-long biodiversity blitz for middle school students has been offered at Black Rock Forest for 10 years in the format of an academic summer science class. Students begin each day with guided readings and discussion related to the daily topics that include biodiversity, classification of life, ecosystem services, plant and bird identification, and field survey methods. Midday includes hikes and data collection followed by games, art, cooking, data analysis, and presentations. Black Rock Forest is a nearly 1620-ha (4000-acre) private field station and conservation area (Audubon IBA) in Orange County, NY, that features *Quercus* (oak)-dominated deciduous forest, *Tsuga* (hemlock) ravines, *Pinus rigida* (Pitch Pine) and *Quercus ilicifolia* (Scrub Oak) ridgetops, early successional fields, and numerous ponds and streams. This array of topo- and chronosequences contributes to high habitat diversity. For the last 5 years (2014–2018), we used pre- and post-course surveys to assess the effectiveness of this experience on student learning ($n = 47$), including a question that asked students to describe or draw a forest before and after the experience. Students had 10 minutes to complete each response. Surveys were rated by 2 different instructors to ensure reliability. A simple holistic rubric was used to obtain average scores for the surveys. A *t*-test indicated that student learning gains were highly significant ($P < 0.001$), and the Cohen's d statistic (1.303) suggests a very large effect size. This information is useful as evidence of a meaningful student experience and as a guide for successful natural history curriculum development.

Sat- 60

The Role of Free-Floating Macrophytes in Sequestration of *E. coli* in the Scantic River (CT)

Kirsten H. Martin (University of Saint Joseph, West Hartford, CT)

Abstract - Each summer since 2015, several sites along the Scantic River (CT) have been monitored weekly for *Escherichia coli* levels. High levels (>575 cfus/100 ml) have been recorded throughout the river, leading the CT Department of Energy and Environment to list the lower portion of the Scantic River on its list of impaired waterways. One location, Somersville Mill Pond (Somers, CT), has consistently low levels of *E.coli*, despite high levels being recorded immediately upriver of the sampling location. The mill pond has extensive free-floating vegetation mats. Research in terrestrial systems suggests that specific types of vegetation have the ability to sequester *E .coli* in root systems as well as other plant tissues. The purpose of this study is to investigate the ability of free-floating macrophytes to sequester *E.coli.* I collected samples of river water and aquatic vegetation weekly from 25 July 2018 to 26 September 2018. I processed the water samples using the IDEXX Colilert methodology. Samples were incubated for 24 hours and viewed under a UV light. The most probable number of *E. coli* colony-forming units were determined from an MPN table.

Sat- 39

Effects of Tip-up Mounds and Mammal Burrows on Species Richness and Total Abundance as Measured Using Camera Traps in a Vermont Suburban Natural Area

Kyle Masters (Saint Michael's College, Colchester, VT), **Julia Bowen** (Saint Michael's College, Colchester, VT), **Lilia Deangelis** (Saint Michael's College, Colchester, VT), and Declan McCabe (Saint Michael's College, Colchester, VT)

Abstract - Habitat structure has been hypothesized to increase biological diversity at wooded sites. In established wooded sites, tree falls increase habitat diversity by depositing large woody debris and creating tip-up mounds when rootstocks pull large quantities of soil from the ground leaving depressions behind that sometimes fill with water. We undertook this observational study to determine if tip-up mounds have higher animal diversity when compared to holes and control sites due to the influence of habitat structure. Species richness should be greater in areas with more habitat diversity; thus, we hypothesized that tip-up mounds will yield higher species richness values per camera when compared to holes and controls. Tip-up mounds have higher elevations ranges and thus more habitat niches, whereas holes may well be occupied by a single species. To address this hypothesis, we placed camera traps at 7 tip-up mounds, 6 holes, and 5 control locations in the Saint Michael's College Natural Area, Colchester, VT. Cameras remained running between mid November 2018 and mid February 2019. Thirteen species were observed including *Urocyon cinereoargenteus* (Gray Fox), *Vulpes vulpes* (Red Fox), *Lynx rufus* (Eastern Bobcat), *Sylvilagus floridanus* (Eastern Cottontail), *Canis latrans* (Northeastern Coyote), *Sciurus carolinesnis* (Eastern gray squirrel), *Tamiascurus hudsonicus* (American Red Squirrel) *Odeocoileus virginianus* (White-tailed Deer), *Procyon lotor* (Raccoon), *Didelphis virginiana* (Virginia Possum), and multiple species of birds. The general trend observed was that control sites attracted more species than either holes or tip-ups. Similarly, total abundance was slightly higher at control sites than at the other sites. Tip-ups had the lowest abundance and richness. These results run contrary to ecological theory and are important for forestry management with implications for salvage logging.

Sat- 21

Phenological Shifts in Bees with Varying Life-History Traits in the Genus *Colletes*

Max W. McCarthy (Tufts University, Medford, MA), Nicholas N. Dorian (Tufts University, Medford, MA), and Elizabeth E. Crone (Tufts University, Medford, MA)

Abstract - The effects of anthropogenic environmental change have been documented in many organisms, including changes in the timing of species' life histories (phenologies). Although phenological advances have been documented in several bee species, the current literature is biased towards spring-active generalist species. However, bees exhibit a wide variety of life-history traits, including specialization on a narrow range of plant taxa and summer and autumn flight seasons. Using museum specimen label data, we analyzed trends in collection day-of-year over time as an indicator of phenological change for 6 bee species in the genus *Colletes*. These species vary in life-history traits: 2 are spring generalists, 1 is a spring specialist, and 3 are fall specialists. In total, we analyzed 2123 unique records spanning the years 1885–2018. Significant and opposite patterns were detected in 2 species with differing life histories (an early-season generalist and a late-season specialist), suggesting that the phenologies of these bees are shifting and that these changes may be influenced by seasonality and/or host-plant specificity. It is important to understand phenological trends in insect pollinators in order to assess whether temporal mismatching could occur between pollinators and their host plants.

Sat- 6

Nest Initiation Dates in a Changing Climate: Savannah Sparrows and Bobolinks Respond to Climactic Variables from their Wintering Grounds

Maeve McGowan (Department of Environmental Studies, 11 Hills Beach Rd, University of New England, Biddeford, ME), Noah Perlut (Department of Environmental Studies, 11 Hills Beach Rd, University of New England, Biddeford, ME), Allan Strong (Rubenstein School of Environment and Natural Resources, University of Vermont, Burlington, VT)

Abstract - While some songbird species have adjusted their migratory and reproductive behavior in response to phenological shifts resulting from climate change, others have shown little to no response. Using data from 2002–2018, we aimed to explain how phenological shifts caused variation in nest initiation dates of 2 migratory grassland songbird species, *Passerculus sandwichensis* (Savannah Sparrow) and *Dolichonyx oryzivorus* (Bobolink), breeding in agricultural fields on Vermont. We used temperature and precipitation data for both species' respective wintering, extended stopover, and breeding sites, in addition to regional climate data, including the North Atlantic Oscillation (NAO) and the El Niño Southern Oscillation (ENSO). For Savannah Sparrows, variation in nest initiation date was best explained by the interaction between precipitation in Georgetown, SC (the mean wintering location for females), and the ENSO index for the wintering months. For Bobolinks, variation in nest initiation date was best explained by the interaction between average temperature in Barquisimeto, Venezuela (the primary stopover site on their migration path), and the NAO index for November through March. Over the study, nest initiation dates advanced by 4 and 3 days for Savannah Sparrows and Bobolinks, respectively. At the same time, first-haying dates changed by ~10 days. Because Bobolinks and Savannah Sparrows rely on agricultural grasslands for breeding habitat, their reproductive success is primarily dependent on the timing and frequency of haying. If the shift to earlier mowing continues, and nest initiation dates continue to advance more slowly, we predict that the impact of the timing of haying on reproductive success may decrease over this century.

Sun- 12

Assessing Impact of Dam Removal on Densities of *Anguilla rostrata* (American eels) in the Mill River, Taunton, Massachusetts and the Town River, West Bridgewater and Bridgewater, Massachusetts

Patrick M. McKenna (Bridgewater State University, Bridgewater, MA), Samantha King (Bridgewater State University, Bridgewater, MA), Rianna Tamulynas (Bridgewater State University, MA, Christine Aucoin (Bridgewater State University, Bridgewater, MA), and Kevin D. Curry (Bridgewater State University, Bridgewater, MA)

Abstract - *Anguilla rostrata* (American Eel) is a catadromous fish listed as endangered on the ICUN red list, though not currently listed as endangered by the US Fish and Wildlife Service. The inability for larger American Eels to migrate upstream due to dams contributes significanlty to the decrease of the eel populations. Changes in lengths of elvers and yellow eels above and below the Reed and Barton Dam were compared before and after dam removal between Fall 2017 and 2018 on the Mill River in Taunton, MA. Sites were compared based on distance upstream from the mouth and number of barriers downstream. Data collected on eels after dam removal revealed that there was a large drop in densities both above and below the site of the former dam in 2018 compared to 2017. Densities were found to be greater in the upstream site compared to the downstream site after dam removal in 2018.

Sat- 33

Land Use and Tree Diversity

Kaila McKiernan (SUNY Geneseo, Geneseo NY), **Cathy Kilada** (SUNY Geneseo, Geneseo NY), Kaila McKiernan (SUNY Geneseo, Geneseo NY), Cathy Kilada (SUNY Geneseo, Geneseo NY), and Suann Yang (SUNY Geneseo, Geneseo NY)

Abstract - The decisions people make when planting trees regarding choice of species has the ability to impact the environment on a large scale. The decision of planting native vs. nonnative species has the ability to affect biodiversity and therefore the ecosystem services of a given environment. Our research project aims to analyze the reasons and choices people make regarding tree type in an attempt to identify the impact these choices have on the environment. We conducted our research by surveying residents from the town of Geneseo while also administering an online survey to the SUNY Geneseo student body in order to determine if there is a common trend across New York State regarding tree choice and reasoning. We distributed a paper version of our survey to the residents of the town of Geneseo and conducted an online survey with the Geneseo student body in order to determine if there is a trend in tree choice and reasoning. In both surveys, we asked the same questions in an attempt to isolate the factors that may play a role in a person's tree choice, such as its price, its native or nonnative status, and a person's previous knowledge of trees. We also included a section for the participant to include their most important factors when choosing a tree to plant. Our preliminary results reveal that the type of tree one chooses to plant and the reasoning are linked. The primary reason people choose to plant particular trees appears to be aesthetics, which, without consideration as to if the plant is invasive, may end up being a choice that is detrimental to the local ecosystem. Both the scientific community and the general public should be aware of how tree choice can have consequences on the ecosystem. This underscores the need to educate the public about how their choices could potentially be harmful to the environment.

Sat- 20

Comparing Resource Allocation of Fruiting Native and Invasive Species

Rheanna Meier (SUNY Geneseo, Geneseo NY; rym1@geneseo.edu) and Suann Yang (SUNY Geneseo, Geneseo NY)

Abstract - The ability of invasive plant species to rapidly overtake native flora has become a growing problem in the Northeast US and elsewhere. A variety of mechanisms may contribute to this ability, such as different strategies of resource allocation to fruit and flowers in native compared to invasive species. Life-history theory suggests that fruit and flower size should be inversely related, since the plant has a finite number of resources. We hypothesize that there is a ratio of fruit to flower size that allow invasive species to quickly outcompete native species—a larger flower would allow for better pollination, but a larger fruit would allow for better dispersal. To test this hypothesis, we measured both fruit length and width, as well as flower area of multiple native and invasive species found in the Spencer J. Roemer Arboretum on the SUNY Geneseo campus. Our preliminary results show that fruit size is comparable across both native and invasive species. However, invasive species appear to have much larger flowers. These findings suggest that invasive species would have an advantage when it comes to reproduction. Pollinators may be more inclined to visit the large, colorful flowers of invasive species rather than the small ones found on native species. Additionally, these results may also indicate that fruit and flower size are not completely inversely related—perhaps consideration also needs to be given to how much these plants allocate resources to other areas, such as root production.

Sat- 11

Effects of Asian Shore Crab Abundance on Biodiversity of Intertidal Invertebrates in New England

Lindsey Meola (Bridgewater State University, Bridgewater, MA) and Christopher P. Bloch (Bridgewater State University, Bridgewater, MA)

Abstract - *Hemigrapsus sanguineus* (Asian Shore Crab) is a common and abundant invasive species on rocky shores of New England. Because of its rapid population growth, omnivorous diet, and strong competitive ability, it has been blamed for major declines in multiple species of prey and competitors throughout its introduced range. Nevertheless, few studies have followed its effects on local biodiversity over time, and even fewer at more than a single site. The objective of this study was to examine effects of the Asian Shore Crab on biodiversity of intertidal invertebrates at 10 cobble and boulder beaches in southern New England (Massachusetts and Rhode Island) over a 5-year period from 2014 to 2018. Although some sites experienced a decline in biodiversity over this time, results were spatially idiosyncratic, and different measures of biodiversity (richness, evenness, dominance, and rarity) responded in different ways. In general, biodiversity of sites was not strongly correlated with abundance of the Asian Shore Crab. This finding may suggest that prey populations are rescued by colonization of planktonic or rafting larvae from less-impacted sites, or that the most severe effects of the Asian Shore Crab on biodiversity occurred soon after colonization.

Sat- 56

The Effects of Estradiol and Parasitism on *Daphnia dentifera*

Shekina Moise (SUNY Plattsburgh, Plattsburgh, NY) and Alyssa Gleichsner (Department of Biological Sciences, SUNY Plattsburgh, Plattsburgh NY)

Abstract - Freshwater organisms encounter various stressors in their environment that impact their survival, growth, and reproduction. These effects then cascade up and down food webs, impacting whole aquatic systems. One of these stressors is the presence of parasites in the environment, which infect other organisms (hosts) and cause disease. Parasites are in turn impacted by other environmental stressors, such as pollutants, which may increase or decrease disease in their hosts. Zooplankton, such as *Daphnia* typically form the basis of food webs in freshwater systems. The expansion of the pharmaceutical industry has increased the variety and concentration of leachates introduced into freshwater systems. Estradiol is one such toxin and a pollutant of emerging concern. Estradiol is an estrogen steroid hormone largely responsible for the development of female secondary sexual characteristics in vertebrates. The presence of this hormone in freshwater systems has been linked to changes in morphology and survival in many organisms, including fish. To examine the impact of multiple stressors (pollution and disease) on *Daphnia* life history, we used the obligate-killing fungal parasite *Metschnikowia bicuspidata*, which is abundant within the Lake Champlain Basin, and estradiol exposure on *Daphnia dentifera*. A full-factorial experimental design was conducted. We recorded the mortality and reproduction of *Daphnia* individuals daily, as well as parasite infection rates and intensity. This research highlights the need to examine an organisms ability to respond to multiple stressors to better understand potential full ecosystem impacts.

Sun- 46

Effect of Snow Cover on Temperature and Seedling Survival

Helena Mueller (SUNY Plattsburgh, Plattsburgh, NY) and Mark Lesser (SUNY Plattsburgh, Plattsburgh, NY)

Abstract - Snow cover may act as an important temperature regulator for tree seedlings. Snow cover can mitigate the effects of direct winter cold and protect seedlings from ice and wind exposure, preventing freezing and potential mortality. Finally, snow cover maintains warmer and more consistent soil temperature which helps keep seedling roots from freezing. This study aims to better understand the role of snow cover on the survival and growth of *Pinus banksiana* (Jack Pine) seedlings located at the Altona Flatrock pine barren in northeastern New York. We are particularly interested in survival of these seedlings because they germinated in September following a 500-ha forest fire in July 2018, meaning they have had a very short initial growing season heading into their first winter. This shortened growing season may have influenced winter hardiness and freezing tolerance. To study effects of snow cover on seedling survival and growth, we established 3 sites where seedling regeneration was high (average of 67 seedlings/m^2) within the burned area. Within each site, we established three 1 m x 1 m plots: one plot was designated as no snow, one as ambient snow, and one as double snow. In each plot, we counted all seedlings and measured their height in November 2018, before the first snowfall. We placed an iButton sensor on the ground in each plot to continuously record temperature and humidity every hour at the soil surface. Following the first snowfall, no-snow plots were cleared of snow and double-snow plots had snow added to them. We will continue to remove and add snow once a week until the final snow event in spring 2019. Preliminary temperature data (December to mid February) shows that on average the no-snow plots were >1 °C colder than both other treatments. No-snow plots also had higher variability between min and max temperatures (on average >5 °C difference versus <2.7 °C difference for the other 2 treatments). After final spring snowmelt, we will count live seedlings to assess overwinter mortality. We will re-measure seedling height throughout the growing season to assess lasting impacts of winter conditions on growth.

Sun- 20

Understanding Carbon Sources and Energy Flow in Ponds of Different Trophic Status

Penelope W. Murphy (Hobart and William Smith Colleges, Geneva, NY) and Meghan Brown (Hobart and William Smith Colleges, Geneva, NY)

Abstract - Ponds are hotspots for diversity that provide important ecosystem services. They also serve as model systems for investigating food-web dynamics that are relevant to larger lake systems. We studied 2 neighboring ponds that differ in their trophic status—one is eutrophic, the other oligotrophic—despite their shared terrestrial surrounding, management strategy, and human-constructed, mid-century origin. We investigated primary productivity and food-web structure using carbon and nitrogen isotopes to test the hypothesis that the food webs of these ponds vary in their utilization of carbon sources (e.g., terrestrial-based detritus, macrophytes, periphyton, phytoplankton) and how energy flowed into primary, secondary, and tertiary consumers. As expected, the consumer communities of both ponds exploited terrestrial-based carbon but differed in the dominant source of autochthonous carbon. The oligotrophic pond incorporated more benthic carbon sources into its food web, while the more productive pond was skewed to pelagic carbon sources, findings which correlate with the observed primary production in these regions of the ponds. There were also differences at higher trophic positions, including the types of fish and their diets. This study adds to the growing body of work dedicated to understanding the factors that dictate productivity and energy flow of freshwater systems.

Sun- 48

Herbivory and Arthropod Abundance on Native and Invasive Understory Shrubs

Samantha N. Muscat (SUNY Geneseo, Geneseo, NY) and Jennifer L. Apple (SUNY Geneseo, Geneseo, NY)

Abstract - The focus of this study is the exploitation of native and invasive shrubs by insect herbivores and other arthropods. Previous work on *Cornus racemosa* (Gray Dogwood) in SUNY Geneseo's Roemer Arboretum showed that this native shrub is subject to higher rates of herbivory than invasive species such as the *Lonicera maackii* (Amur Honeysuckle) and *Elaeagnus umbellate* (Autumn Olive). This study expands on these results by targeting specialist herbivores that only feed on the Gray Dogwood shrub, in particular several leaf-rolling caterpillars. We sampled leaf rolls on randomly selected branches of 30 Gray Dogwood shrubs to quantify leaf area lost to caterpillar herbivory as well as damage from a specialized leaf galler and fungal pathogen. We photographed leaves with a digital camera and quantified damage using ImageJ. The sampling was performed in the beginning and end of the summer season of 2018. Additionally, to compare use of these shrubs by higher trophic levels in addition to herbivores, we collected samples of arthropods on 10 shrubs each of Gray Dogwood, Amur Honeysuckle, and Autumn Olive using a beat-sheet method to dislodge them onto a white canvas. Although damage was significantly higher in June, there was no correlation between June and August damage, suggesting branches attacked in the past are not more vulnerable to future attack. These results contribute to our understanding of patterns of herbivory by leaf-roll inducing caterpillars and highlight differences in how invasive vs. native species contribute to the local food web.

Sat- 9

NGS Reveals Trophic Transfer of Hg in Songbirds in Acadia National Park

Batya Nightingale (SUNY Purchase, Purchase NY), Allyson Jackson (SUNY Purchase, Purchase NY), Stephen Harris (SUNY Purchase, Purchase NY), Alex Youre-Moses (SUNY Purchase, Purchase NY)

Abstract - Mercury is a toxic pollutant that is spread around the earth through both natural and anthropogenic dispersion. Further investigation into the flow of mercury through riparian ecosystems is needed. Studies show that adult breeding songbirds are effective indicators of mercury in terrestrial ecosystems. We collected songbird fecal and blood samples in June and July of 2018 from 2 sites in Acadia National Park in Maine. Our goal is to identify if a particular diet item or guild (emergent or terrestrial insect) is correlated with elevated mercury levels of songbirds. Hg concentrations in songbird blood varied from 0.149 to 0.297 ppm ww at Hunter's Brook (n = 8) and 0.029 to 0.336 ppm ww at Marshall Brook (n = 8). Preliminary data show a correlation between a diet of insects and songbird blood mercury levels. DNA metabarcoding of songbird fecal samples paired with mercury analysis of songbird blood samples should demonstrate if a particular diet item or diet class is correlated with elevated exposure to mercury in songbirds.

Sun- 10

Detecting Turtle Presence in Ward Pound Ridge Reservation

Kendall O'Connell (Westchester County Parks, Recreation, and Conservation Department, Cross River, NY)

Abstract - In the State of New York, many species of turtles are listed as endangered, threatened, or special concern. Because there are so many factors affecting the status of turtle populations throughout the state, it is of continued importance to understand their presence in varying habitats. This project summarizes the results of one field season of data collection for an ongoing study researching turtle populations in Ward Pound Ridge Reservation, a 1747-ha (4317-acre) preserve spanning multiple habitat types in southeastern New York. I collected data from April to October of 2018 using a combination of baited aquatic hoop traps and transect visual surveys to determine turtle presence. Over the course of the field season, I found 52 individual turtles within 5 different species in the park. Identified turtles included 15 *Chrysemys picta picta* (Painted Turtle), 14 *Terrapena carolina carolina* (Eastern Box Turtle), 13 *Chelydra serpentina* (Snapping Turtle), 6 *Clemmys gutatta* (Spotted Turtle), and 4 *Glyptemys insculpta* (Wood Turtle). I identified recaptures of Painted Turtles and Wood Turtles by notches made on their shell upon initial capture, Eastern Box Turtles by the unique carapace appearance, and Snapping Turtles by their location and estimated size. Including recaptures, there were over 75 turtle sightings. From these preliminary results, several research projects are set to begin in the 2019 season to better understand these populations.

Sun- 40

Characterization of Muddy Intertidal Infaunal Communities in Depleted Soft Shell Clam (*Mya arenaria*) Flats

Sarah O'Malley (Maine Maritime Academy, Castine ME)

Abstract - Recent studies suggest that declining *Mya arenaria* (Soft Shelled Clam) recruitment in formerly productive coastal Maine clam flats is due to predation by *Carcinus maenus* (European Green Crab) rather than by lack of breeding adult clams. This study surveyed the muddy intertidal zone of Northern Bay on the Bagaduce River in Penobscot, ME, with the goal of characterizing the infauna community and focusing in particular on potential clam predators. Preliminary findings point to a robust community of non-predatory sedentary and tube-dwelling polycheate worms, with lesser amounts of carnivorous polycheates. We documented other clam predators, including *Cerebratulus lacteus* (Milky Ribbon Worm) and *Limulus Polyphemus* (Horseshoe Crab), but in very low numbers. The findings support the hypothesis that European Green Crabs are the primary predators of Soft Shelled Clams in the Bagaduce.

Sun- 53

Tannin Variation in Eastern Hemlock Bark

Aswini Pai (St. Lawrence University, Canton, NY) and Thomas J. Murphy (St. Lawrence University, Canton, NY)

Abstract - Tannins protect plants against pathogens and herbivores and are found in many plant tissues including leaves, fruits, and bark. Commercially, tannins are used in tanneries to process animal hides and in the botanical supplements industry as laxatives. However, the harvest of bark tannins by stripping trees of their bark can result in death of individual trees and population decline in the species. We examined variation in tannin content of *Tsuga Canadensis* (Eastern Hemlock). We collected bark samples from 23 trees at 5 locations; the Little River Nature Center, Massaweepie scout camp, and Glen Meal, Lampson Falls, and Higgley Flow state parks in northern New York. We extracted tannin from the bark using 50% methanol and quantified it using a protein assay developed by Hagerman. We examined how tannin content and yield from individual trees varied with bark thickness and tree age. Preliminary analysis indicates that there is a strong correlation ($r = 0.78$, $P < 0.05$) between tannin concentration and dbh (diameter at breast height) and bark thickness, but there is a variation among sites. This information can assist in the formulation of a sustainable management plan for the species.

Sun- 17

Does Soil Moisture and Soil Texture Predict the Distribution of American Beech and Sugar Maple?

Morgan Forest Perlman (Middlebury College, Middlebury, VT) and David N. Allen (Middlebury College, Middlebury, VT)

Abstract - Forest census data in a 1-ha old-growth northern hardwood forest plot in Middlebury, VT, was used to understand the relationship between soil characteristics and the distribution of 2 associated forest tree species: *Acer saccharum* (Sugar Maple) and *Fagus grandifolia* (American Beech). We established 25 circular sample sites (10 m radius) in the forest plot, within which we calculated basal area for Sugar Maple and Beech. We took soil moisture samples on 12 separate days in triplicates at the center of each site. We also collected soil cores at each site for texture analysis. Relationships between species-specific basal area and soil characteristics were fit using maximum likelihood estimation. We selected the best model using Akaike information criterion (AIC). Beech in general prefers drier sites, while Sugar Maple increases in basal area in moister environments. Meanwhile, American Beech generally increases in basal area with increased sand composition of the soil, and the opposite is the case with Sugar Maple. Silt composition is generally positively correlated with Sugar Maple distributions, and the opposite is the case with American Beech. Overall, AIC values for all the models reveal that within a species, soil texture and soil moisture may be equally predicative of basal area. Soil moisture, however, is certainly a better predictor of Sugar Maple. Silt, meanwhile, is by far a better predictor for Sugar Maple basal area than for American Beech basal area. The findings here suggest that these 2 species have microscale ecological niches that are largely described by even slight differences in soil moisture and texture. The biological interactions between these 2 tree species and their microscale soil environment suggest a need to reevaluate simplified models that assume single abiotic variables, such as light availability, are adequate for predicating forest dynamics.

Sat- 22

Exploring the Relationship between Recreational Trails and Plant Invasion in Southeastern Connecticut

Asa Peters (Connecticut College, New London, CT) and Chad Jones (Connecticut College, New London, CT)

Abstract - Plant invasions have been shown to be linked to the presence of roads and trails in prior studies. This is an observational study of plant invasion in southeastern Connecticut focused on the relationship between plant invasion and recreational trails at Barn Island Wildlife Management Area in Stonington, CT. While there is heavy plant invasion in the forests of southeastern Connecticut, this invasion is not equally distributed. We surveyed 32 plots for invasive plant individuals within subplots 0 m, 10 m, and 20 m from walking trails. We took into account the parameters of canopy light, trail size, forest age, distance from forest edge, and distance from trail head when considering the presence of invasive plants both directly along trails and penetrating into the forest. So far, this study has shown a higher amount of invasive plant individuals in younger forest along trails and 10 m and 20 m into the forest. A prior study on invasion along trails also showed more invasive individuals along wider trails when compared to narrow trails, more invasive individuals in young forest (younger than 1934) than old forest (existent before 1934). This same study also showed a positive relationship between plant invasion and the distance to forest edge. Examining these relationships provide avenues for using thoughtful land management as a way of limiting plant invasion.

Sat- 10

Pollinator Visitation of Spring Ephemerals and Spatial/Temporal Variability

Hunter T. Phillips (MCLA, North Adams, MA)

Abstract - Knowledge of the dynamics of plant–pollinator interactions is important to conservation efforts to protect both pollinator and plant biodiversity in the face of worldwide insect decline, threats to agriculture, and other threats to conservation. Pollination systems have been shown to favor specialization, a natural process in which pollinators tend to visit specific plant species, and both evolve alongside one another. It has been found that floral traits favor certain pollinator species and drive speciation. Competing evidence supports a more generalist approach to pollination, where pollinators forage locally and pollinate the species in their "neighborhood". This neighborhood approach to pollination allows for flexibility in both pollination services and pollinator food sources. These are ecological traits that would allow both pollinator species and flowering species to respond in shifts in habitat due to climate change and loss in biodiversity. We propose a study that focuses on pollinator visitation of spring ephemerals in order to determine if spring ephemeral pollination favors a more generalist approach or a more specialist approach. We hypothesize that spring ephemeral pollination will favor generalization. If population density is low, it may be advantageous for plant species to rely on multiple pollinators present in that specific region. Using a waterproof digital photography system, we will monitor multiple spring ephemeral species over 24 hours at 2 locations located in Western Massachusetts. Video documentation of multiple pollinator species visiting a single spring ephemeral species could support the neighborhood model of pollination by showing that different individuals of the same species separated spatially do vary in their pollinator visitation based on their location.

Sun- 30

The Effect of Density and Diet Quality on Lepidopteran Larvae Melanization

Nikki Pirtel (University of Connecticut, Storrs, CT, **Amanda Minicucci** (University of Connecticut, Storrs, CT), James Mickley (University of Connecticut, Storrs, CT), Leone Brown (Tufts University, Medford, MA), David Wagner (University of Connecticut, Storrs, CT), and Robert Bagchi (University of Connecticut, Storrs, CT)

Abstract - Variation in melanism, or skin pigmentation, in Lepidopteran larvae can be caused by numerous genetic and environmental factors. Competition, food quality, and upregulation of immune systems have all been suggested as possible causes of melanization. The complex interaction of variables, therefore, makes it difficult to pinpoint the origins of this physical change. We conducted a field survey and laboratory experiment to examine the role of competition and diet quality in causing melanization. The field study characterized the relationship between *Lymantria dispar* (Gypsy Moth) abundance during an outbreak year and the level of melanization found in other Lepidopteran species from the same sites. We photographed caterpillars from 32 forest fragments in eastern Connecticut and analyzed them using image analysis software to quantify melanism. The level of Gypsy Moth larvae was also estimated in these same forest fragments using surveys. Hyperabundance of Gypsy Moth could both increase competition among caterpillars and lower food quality by inducing plant defense. To distinguish between these possibilities, we examined the interaction of density and diet quality of leaves collected from small (<100 ha) and large (≥100 ha) forest fragments on the expression of melanic forms in *Biston betularia* (Peppered Moth) larvae in a lab experiment using a similar method of color assessment. In the field surveys, higher relative abundance of Gypsy Moth marginally increased the frequency of darker color morphs in other Lepidopteran species. In the laboratory study, leaf water content (a measure of leaf quality), increased with fragment size, but there was no associated increase in melanization. However, melanization increased substantially as caterpillar density increased. Our results suggest that pigmentation may be a response to greater caterpillar density rather than altered food quality. Possible reasons for the observed increase in melanism could include altered camouflage to account for defoliation (resting on brown branches) or upregulation of immune response to resist high density-dependent disease pressure.

Sun- 28

Sediment Transport in the Hoosic River

Hannah Poplawski (MCLA, North Adams, MA), Elena Traister (MCLA, North Adams, MA), and Cindy Delpapa (MA Division of Ecological Restoration, Boston, MA)

Abstract - Research on sediment transport in the Hoosic River has been ongoing since 2017. This project aims to determine how dams upstream of concrete flood-control chutes influence suspended sediment concentrations. The North and South Branches of the Hoosic River both run through concrete chutes. Sample sites initially included locations upstream of the dam on each branch as well as within the concrete chutes on each branch. We have subsequently added 2 more sites due to the sediment input from a downed panel between sampling locations on the North Branch. We will make at least 6 collections throughout the semester, half of which will be conducted during wet weather and the other half during dry weather. We will use a Van Dorn water sampler that collects 2 liters of water at a time. We will bring samples back to the lab to be filtered and oven-dried at 105 °C for 24 hours. Results will contribute to a better understanding of sediment transport in the Hoosic River, which will in turn inform the design of a modernized flood-control system for the Hoosic River.

Sat- 35

Frequency Sensitivity and 3-D Processing of Sound Source Cues in the Northern Saw-whet Owl (*Aegolius acadicus*)

Glenn Proudfoot (Vassar College, Poughkeepsie, NY), Julia R. Beatini (Vassar College, Poughkeepsie, NY), Megan D. Gall (Vassar College, Poughkeepsie, NY), and Megan de Koning (Vassar College, Poughkeepsie, NY).

Abstract - *Aegolius acadicus* (Northern Saw-whet Owl) is known for its unique asymmetrical ear structure and impressive ability to localize prey, yet few attempts have been made to explore the auditory capabilities of this species. In this study, we evoked auditory brainstem responses (ABRs) with clicks and tones to assess auditory sensitivity. We found that the ABR amplitude increased with increasing stimulus amplitude for both clicks and tones, consistent with results in other avian species. ABR amplitudes, latencies, and thresholds indicate that the hearing range of Northern saw-whet owls extends from 0.7 and 8.6 kHz, with an extended range of best frequency sensitivity between 1.6 and 7.1 kHz. Sensitivity fell off rapidly above and below these frequencies. The average audiogram was structurally similar to those found in other species of owls. However, ABR thresholds were 10–20 dB lower than those of *Megascops asio* (Eastern Screech-owl), with thresholds below 0 dB SPL in some individuals. These lower thresholds may arise from the same selective pressures that favor the squamoso-occipital wing that vaults over the entrance to the ear canal in Northern Saw-whet Owls and is thought to enhance the benefits of the asymmetrical ear anatomy. We also found that Northern saw-whet owls have increased sensitivity to sound sources above their beaks and decreased sensitivity to sound sources below and behind their heads. Northern saw-whet owls have similar sensitivities in the left and right ears. The spatial region of highest sensitivity extends from the beak to the crown of the head, and 30° left or right of the median plane, suggesting that directional sensitivity is useful during foraging and predator evasion.

Sat- 30

Haemosporidian Prevalence in Northern Saw-whet Owls (*Aegolius acadicus*) is Predicted by Host Age and Average Annual Temperature at Breeding Grounds

Glenn Proudfoot (Vassar College, Poughkeepsie, NY), Monica L. Carlson (Drexel Univ. Philadelphia, PA), Kaya Gentile (Drexel Univ. Philadelphia, PA), Janice Dispoto (Drexel Univ., Philadelphia, PA), and Jason D. Weckstein (Drexel Univ., Philadelphia, PA).

Abstract - Understanding factors that determine haemosporidian prevalence is critical in predicting how parasite and avian host populations will respond to environmental change. Here, we used molecular screening of blood samples from migrating *Aegolius acadicus* (Northern Saw-whet Owl) in eastern North America to characterize haemosporidian infections and examine parasite prevalence with respect to abundance of migrants, timing of migration, climatic conditions at the breeding grounds, and avian host age. We identified 3 haemosporidian genera (Leucocytozoon, Plasmodium, and Haemoproteus) and discovered a new lineage of Leucocytozoon that is thus far specific to the Northern Saw-whet Owl. We found no significant relationship between parasite prevalence and abundance or timing of migration of Northern Saw-whet Owls. After-hatch-year birds were significantly more likely to be parasitized by Leucocytozoon than hatch-year birds, whereas prevalence of Plasmodium was higher in hatch-year birds. Of the 3 climatic variables analyzed at owl breeding grounds (temperature, precipitation, and snowpack days), lower average annual temperatures significantly increased the chance of a bird being parasitized by Leucocytozoon; no significant temperature-dependent relationship was found for Plasmodium. This study contributes to our general understanding of the relationship between parasite prevalence and host density, host age, resource abundance, and abiotic factors such as temperature and precipitation.

Sun- 9

Estimating Deer Populations in Northern Adirondack Forests

Jesse Pruden (SUNY Plattsburgh, Plattsburgh, NY), Mark Lesser (SUNY Plattsburgh, Plattsburgh, NY), and Danielle Garneau (SUNY Plattsburgh, Plattsburgh, NY)

Abstract - Overpopulation of *Odocoileus virginanus* (White-Tailed Deer) can have negative effects on forest health and regeneration. Understanding impacts of regional deer density on forests is important for land owners and may influence management decisions regarding both size of deer populations and silvicultural practices. Regional deer abundance, however, is highly heterogeneous at fine spatial-scales (≤1 km) where the amount of edge, thermal cover, predation risk, and snow depth may influence habitat use. Objectives of this project were to (1) estimate regional deer population size in northern hardwood forests of the Champlain Valley, (2) determine how deer are differentially using forest stands with different management histories, and (3) determine impacts of that usage on forest health and regeneration. Field sites were located in a northern hardwood forest on William H. Miner Institute property in Clinton County, West Chazy, NY. We divided the site into 2 stand treatments: recently harvested ≤10 years) and mature stands (had not been harvested in ≥40 years). Species richness was 10 for both the recently-cut and mature stands. However, the dominant species in the mature forest were *Acer Saccharum* (Sugar Maple) and *Fagus grandifiolia* (American Beech) (40% of relative abundance), while the dominant species in the recently cut stand were *Populus deltoides* (Eastern Cottonwood) and American Beech (48% of relative abundance). On average, trees were smaller (6.7 versus 8.3 cm DBH), and density was higher (5750 versus 3200 trees/ha) in the recently cut stand. In each stand, we established 2 deer exclosures and 2 reference plots to assess long-term changes in regeneration. Additionally, starting in March 2018, we deployed 4 game cameras to record wildlife occurrences in each stand. We analyzed occurrence data using camTrapR package to determine usage and activity patterns. Deer favor the mature stand, with independent sightings totaling 172 versus 48 at the recently cut stand. Seasonally, deer use both stand types to a much higher extent in spring and fall compared to summer and winter. Diurnal activity is bimodal with peaks at 6:00 am and 6:00 pm. This project will continue to collect game-camera data and eventually correlate density and usage to forest regeneration.

Sun- 22

Relationship Between the Incidence of an Ant-mimicking Spider (*Myrmarachne formicaria*) and Ant Abundance and Diversity

Alanna Richman (SUNY Geneseo, Geneseo, NY) and Jennifer L. Apple (SUNY Geneseo, Geneseo, NY)

Abstract - *Myrmarachne formicaria* is a non-native ant-mimicking spider that was first recorded in New York in 2006. Little is known about its natural history in its native range in Europe and Asia or in its newly colonized range in North America. Some spider species are Batesian mimics that resemble ants presumably in order to avoid being eaten because many potential predators will not prey on ants. The aim of this study was to investigate the relationship between the incidence of this ant-mimicking spider and ant abundance and diversity to determine if it is associated with ants, even in its invaded range. We collected ant specimens in plots set up to monitor the incidence of *M. formicaria*. We sampled 8 different plots, some located in grassy in habitats and some located in wooded habitats. We used 3 different methods to collect ant specimens—pitfall traps, bait traps, and leaf-litter sampling—and counted and identified ant specimens in each plot. We then compared the abundance and diversity data collected to the incidence of *M. formicaria* in the same plots, and also compared the results for the different methods used for ant collection. As *M. formicaria* is expanding its range, information about its habitat preferences and interactions with other species is critical to our ability to assess its potential ecological impacts.

Sat- 7

Re-visiting the Paleoecological History of High Point State Park, New Jersey

Guy Robinson (Fordham University, New York, NY and New York Botanical Garden, Bronx, NY), Karina Buhler, Columbia University, New York, NY), and Dorothy M. Peteet (NASA/GISS, New York, NY and LDEO, Palisades, NY)

Abstract - A 6.5-m sediment core was extracted from Cedar Bog in High Point State Park as a Columbia University class project. Cedar Bog (41°19'53"N,, 74°3928"”W) is at 463 m elevation on the Shawangunk Ridge. Vegetational and climate history of High Point was reconstructed by Niering in his classic pollen study of Cedar Bog. In revisiting the site of this pioneering work, we improved lithological, temporal,stratigraphic and taxonomic resolution by sampling at 4-cm intervals for loss on ignition (LOI), macrofossils, and pollen, spores, and charcoal. Pollen is almost entirely absent from 650 cm to the base and upsection to 614 cm.; occasional *Pinus* (Pine) grains show poor preservation. Pollen deposition effectively begins ~600 cm, where *Picea* (Spruce) and *Pinus* are the main types, followed by some herbs, grasses and broadleaf shrubs, *Alnus* (Alder) and *Betula* (Birch). At ~566 cm, *Alnus* (Alder) reaches 18% exceeding *Picea* and second only to *Pinus*, indicative of the Younger Dryas (YD) cooling at the end of the last glacial. Meanwhile, LOI, a measure of organic content, which isas below 5% at 650 cm, , had exceeds ded 20% by 580 cm but then declinesd slightly in the presumed YD interval before . LOI rises upsection, then steadily rising above 400 cm to exceed 90% in the late Holocenenear the surface. Earliest macrofossils include pebbles, charcoal, and insect parts. As the sediment becomes more organic, macrofossil remains of *Picea* and *Chamaecyparis thyoides* (Atlantic White Cedar) appear, indicating that cedar has been present almost since deglaciation.
Spores of the dung fungus *Sporormiella* sp. are absent from the late glacial pollen sequence at Cedar Bog, as are other common dung fungal spores such as *Podospora* sp. This is an unexpected finding; *Sporormiella* spores are abundant in late Pleistocene deposits throughout southern New York and northern New Jersey, indicating the presence of large ice age animals (megafauna) such as *Mammut americanum* (American Mastodon) on those lowland landscapes. *Sporormiella* spores typically decline to low numbers at least 1000 years before the YD and before the time of their extinction. We have hypothesised that extinct megafauna migrated to upland refugia for this millennium or longer, but this is not true of Cedar Bog.

Sat- 57

Population Genetics of Reindeer Lichens on Rock Glaciers in Deboullie Public Lands in Northern Maine

Judith L. Roe (University of Maine at Presque Isle, Presque Isle, ME), Bonnie Corey (University of Maine at Presque Isle, Presque Isle, ME), Jesse Rochester ((University of Maine at Fort Kent, Fort Kent, ME), Larry Feinstein ((University of Maine at Presque Isle, Presque Isle, ME), Peter Nelson (University of Maine at Fort Kent, Fort Kent, ME)

Abstract- Five rock glaciers at the base of talus slopes in Deboullie maintain subterranean ice year round and are covered by mats of vegetation. We collected lichen species and extracted DNA from individuals of 2 species, *Cladonia stygia* and *C. stellaris*. We amplified the ITS region of the fungal partner by PCR and sequenced it. Variable length polymorphisms were found in both species with an insertion of 228/234 (*C. stellaris/C. stygia*) bp in the 18S region, which is a likely Group I intron. Haplotype analysis revealed high population genetic diversity with 11 Cla ste and 10 Cla sty haplotypes identified and a phylogenetic network was estimated by the TCS program. Individuals with the same haplotype were found on more than one glacier and at varying heights within a glacier, suggesting that gene flow is occurring both within and between rock glaciers.

Sat- 18

Population Biology of Rockweed *(Ascophyllum nodosum)* in Frenchman Bay: Assessment of a Commercially Targeted and Ecologically Important Species

Maya C. Roe (College of the Atlantic, Bar Harbor ME), Eliza. J. Oldach (Department of Environmental Science and Policy, University of California, Davis, CA) Hannah M. Webber (Schoodic Institute at Acadia National Park, Winter Harbor, ME) and Christopher W. Petersen (College of the Atlantic, Bar Harbor ME)

Abstract - *Ascophyllum nodosum* (Rockweed) is an important canopy-forming brown alga species in the mid-intertidal along rocky shores in New England. It also comprises 90% of Maine's 19-million-dollar seaweed industry. Rockweed fishery limits in Maine include a maximum total rockweed biomass that is allowed to be removed in an area and a minimum cutting height of 16 inches. In order to manage Rockweed harvest, policymakers must carefully consider the alga's ecological and economic roles. To understand the Rockweed resources of Frenchman Bay, we collected data at 16 sites around the bay, examining the extent of the Rockweed beds; the size, weight, and age of plants; and the role that Rockweed plays in influencing the temperature and light levels in the rocky intertidal. Preliminary data suggest that growth rates are largely consistent across sites, larger alga are found in the mid- and lower Bay, and protected and exposed sites yield different biomass data. Rockweed has profound effects on the physical environment of the mid-intertidal, and the effects of harvest on these physical factors and the biological community are not well known. We have begun a set of experiments in Frenchman Bay, comparing areas of simulated harvest to control areas without harvest to try to understand how this species affects light and temperature intensity and community structure in the intertidal.

Sat- 50

The IThe Impacts of Fire Suppression on Pitch Pine Populations of a Maritime Forest in New Jersey

Grace E. Roeder (Monmouth University, West Long Branch, NJ) and Pedram Daneshgar (Monmouth University, West Long Branch, NJ)

Abstract - Since the mid-1900s, the New Jersey Forest Fire Service has utilized prescribed burns in the Pinelands as methods of preemptive wildfire control and a source of regulation for the ecosystem. The Pinelands experience frequent forest fires that prevent the succession of a hardwood climax forest. *Pinus rigida* (Pitch Pine) is a dominant species throughout the Pinelands that benefits from the disturbance of forest fires. Pitch Pines require extreme heat and fire to successfully release seeds from serotinous cones and reproduce. The intentional prescribed fires clear away competing species and provide Pitch Pines with suitable conditions for growth. The Pinelands National Reserve not only includes the Franklin Parker Preserve, but also the maritime forest of Island Beach State Park, where controlled burns are not implemented. To determine the differences in Pitch Pine populations as a result of fire suppression, we sampled the 2 populations radius plots and quadrat sampling. We counted the number of juvenile Pitch Pines within a 10-m radius of a mature tree sampled along with descriptive statistics of the populations such as height, age, and trunk diameter. Awe collected additional data on the soil composition, litter depth, canopy cover and species diversity directly beneath the adult tree and 10 m away from the tree. The results indicated that Franklin Parker Preserve had a greater population of juvenile Pitch Pines in comparison to Island Beach State Park. There were, on average, 7 juvenile trees found per tree sampled in the Pinelands versus only 2 juvenile trees found per tree sampled in the maritime forest site. The results also included taller trees, larger diameters and older trees in Franklin Parker Preserve, further indicating a clear difference in the ecosystems due to fire suppression. This study suggests that over time, fire suppression in a maritime forest reduces the Pitch Pine population and alters the natural environment of the maritime forest.

Sat- 26

Bees of Coastal Napatree Point and Inland Southern Rhode Island

Aya Rothwell (URI, Kingston, RI) and Howard Ginsberg (US Geological Survey, Kingston, RI)

Abstract - We surveyed bees at coastal Napatree Point and 2 inland sites in southern Rhode Island. Bee-bowl transects were used for comparative samples between Napatree and inland sites. We also sampled by netting at Napatree Point. We collected 53 species at Napatree Point (35 species in bee bowls), compared to 66 species in bee bowls at inland sites. Nine species were not previously recorded in RI. The bee fauna at Napatree differed from the inland sites with twig-nesting bees prominent at Napatree and soil-nesting bees common at inland sites. Bee-bowl samples allow objective comparisons between sites, but netting samples captured larger species that were not well sampled by bee bowls.

Sun- 31

Dwarf Pitch Pine Survival, Regeneration, and Understory Community Response to Wildfire at Sam's Point Preserve, NY

Rory Schiafo (SUNY New Paltz, New Paltz, NY), Jessica Reker (Student Conservation Association-AmeriCorps, Cragsmoor NY), Laura Davis Kennedy (Sam's Point Area of Minnewaska State Park Preserve, Cragsmoor, NY), and Eric Keeling (SUNY New Paltz, New Paltz, NY)

Abstract - The Shawangunk Mountains in New York are home to a globally and ecologically rare ridgetop dwarf *Pinus rigida* (Pitch Pine) barren. The role of fire in this specific community type is understudied. In April 2016, a 820-ha (2027-acre) human-caused fire occurred at Sam's Point Area of Minnewaska State Park Preserve, presenting an opportunity to conduct a long-term monitoring study. We seatblished 21 permanent plots (40.5 m^2 per plot) containing a total of 523 Pitch Pines affected by 3 different burn severities (moderate, high, and very high). We measured Pitch Pine vegetative and seedling regeneration and dominant understory relative abundances during each summer for 2016–2018. In 2018, we conducted a complete understory plant survey. Data taken on each tree included resprouting type (basal, epicormic, apical, or none), diameter at root collar, and the presence of new cones. For each plot, we recorded the number of Pitch Pine seedlings, average duff depth, dominant vegetation species and percent cover (all vegetation species in 2018), fuel height class, and canopy cover class. Pitch Pine apical resprouting was most frequent in the moderate burn-severity plots, while basal resprouting was most frequent in the very-high severity plots. A majority of the trees that initially produced basal resprouting have not continued to produce new vegetative growth each year, while trees with apical and epicormic resprouting mostly have. The number of trees showing no resprouting increased from 309 trees (59%) in 2016 to 370 (71%) trees in 2017. The 390 trees (75%) showing no resprouting by 2018 can be assumed dead. We found 53 Pitch Pine seedlings in 2016, 84 in 2017 and 37 in 2018. We recorded 44 vascular plant species in the understory in 2018. *Gaylussacia baccata* (Huckleberry), *Kalmia angustifolia* (Sheep Laurel), and *Vaccinium angustifolium* (Lowbush Blueberry) dominated plots. *Rhododendron canadense* (Rhodora), a NY protected species, was found within 4 plots. No invasive plant species were found. There were no significant differences in understory community composition between different burn severities. Future monitoring will provide insight into how this rare ridgetop dwarf Pitch Pine barren responds to large, high-intensity fire and will aid in future management at the preserve.

Sun- 25

Exploration of Fox Den Family Dynamics using Camera Trap Data

Christine Schultz (SUNY Geneseo, Geneseo, NY) and Jennifer L. Apple (SUNY Geneseo, Geneseo, NY)

Abstract - *Vulpes vulpes* (Red Fox) is an animal traditionally thought to live in solitude, hunting and living alone. Most research supports the idea that foxes live solitarily; however, there have been some studies that report communal denning among adult foxes. The present study uses camera trap images taken from 3 different cameras, all set to observe a single fox den in the Roemer Arboretum on SUNY Geneseo's campus. We hypothesized that this den is a case of communal denning in Red Foxes, because there appeared to be 2 different litters of pups living in the den in Spring 2018, exhibiting obvious differences in size and coloration. We analyzed >60,000 photos using Digikam photo management software, which involved applying tags to categorize the foxes in each photo (adult, young vs. older pups) and the behavior captured in the images. We then analyzed these tags and image metadata in R using the package camtrapR to organize photos and produce activity plots of adult and juvenile foxes. We will use the activity plots of juvenile foxes to determine when each litter was born relative to each other. Preliminary results suggest that there are at least 2 adult foxes using the den, perhaps 3, and that there were at least 8 pups, likely from 2 different litters, in Spring 2018. These analyses should provide a greater understanding of how foxes interact with each other in communal dens.

Sat- 27

Taxis Bold as Love: The Influence of Aggressive Calls on Mate Choice by Female Gray Treefrogs

Joshua Schwartz (Pace University, Pleasantville, NY)

Abstract - In response to loud calls or physical intrusions by male conspecifics, males of many species of frogs produce aggressive calls. Although the acoustic features of aggressive vocalizations may be well described, we are largely ignorant of their utility and potential costs to the producing and nearby males. In this study, I investigated whether or not production of aggressive calls would compromise the attractiveness of male *Hyla versicolor* (Gray Treefrog) to potential mates. I also investigated whether females exposed to simulated aggressive vocal exchanges would discriminate in favor of putative winners. Using both natural and synthetic aggressive calls, I found that aggressive calls are unattractive relative to advertisement calls, although they possess an ability to elicit phonotaxis by a subset of females in single speaker tests. In 3-speaker tests, I found that female choice behavior is not affected when a simulated male giving advertisement calls vocalizes near one giving aggressive calls if there is no acoustic interference. However, aggressive calls overlapping with advertisement calls have the potential to reduce the attractiveness of the latter relative to unobscured advertisement calls. Finally, females failed to discriminate between a simulated winner and retreating loser suggesting that such outcomes are irrelevant to females or that their ability to eavesdrop is limited. Results also suggest that retreat and return to advertisement calling may be beneficial because they reduce the probability that an adjacent male would intercept an approaching female.

Sat- 44

Using Dendrogeomorphology to Reconstruct Flooding History in the Champlain Valley

Maeve Sherry (SUNY Plattsburgh, Plattsburgh, NY), Mark Lesser (SUNY Plattsburgh, Plattsburgh, NY), and Dave Franzi (SUNY Plattsburgh, Plattsburgh, NY)

Abstract - Understanding the flood history of an area is imperative for land planning. Using tree core samples taken from ring-porous tree species along floodplains, evidence of spring flooding can be determined from certain anatomical abnormalities in the earlywood growth. When a tree is inundated up to the stem, earlywood vessel elements may collapse, and appear at a microscopic level to be constricted and smaller compared to other growth rings. Growth rings that display this characteristic are known as flood rings, and their presence can provide valuable information about the behavior of a water body regarding the maximum flood stage and recurrence interval of floods. In this study, the goal was to identify flood rings and ascertain the maximum flood stage of Lake Champlain, and if possible, establish a recurrence interval. We collected 9 tree cores along a transect from the floodplain to the top slope from *Fraxinus* sp. (ash), *Quercus rubra* (Red Oak), and *Quercus bicolor* (Swamp White Oak) at Wickham Marsh (western shore of Lake Champlain), NY. We used the program J2X to measure and count growth rings for each core and AmScope software to photograph flood rings. Flood rings were found in the 7 trees lowest in elevation along the transect, indicating that flooding has reached at least as high as 2.46 m above current lake level in the past. Although years with flood-rings varied among trees, the most common years in our record, which extended back to 1916, were 1993 and 2011. Our results support that flood events reached at least 2.46 m above lake level in 2011, which was the year of the greatest flood in recorded history of Lake Champlain (1871–present). Interestingly, while 5 of the 9 trees were found to have flood rings in 2011, not all trees at elevations lower than that of the highest recorded flood ring showed signs of flooding, indicating that flood ring formation may differ between species and through time. Having successfully identified flood rings, we will move forward by collecting additional core samples to verify our findings and establish a recurrencse interval of flood events in Lake Champlain.

Sun- 37

The Effects of Cinnamon and Vitamin E on Plant Cell Wall Integrity

Christina Singh (University of Saint Joseph, West Hartford, CT), Kirsten Martin (USJ, West Hartford, CT), Danielle Jordan (USJ, West Hartford, CT), Cinthia Vega-Ortiz (USJ, West Hartford, CT), and Alexa Taylor (USJ, West Hartford, CT)

Abstract - People in the US spend on average a total of $1112 annually on medication maintenance therapies, substantially greater than any other nation. Chronic conditions, such as diabetes and cardiovascular disease, are the 2 major contributors to the costly expenditure. Medications are prescribed in the attempts of improving the quality of life many patients experience through regulating cellular functionality in the body. A major environmental concern arises when pharmaceutical metabolites make their way into aquatic ecosystems, posing a threat to both aquatic and terrestrial plants that rely on water for nourishment. The purpose of this research is to further investigate the role of the commonly utilized over-the-counter medications in the holistic treatment of diabetes and cardiovascular disease, Cinnamon and Vitamin E, may partake in plant cell wall anatomy and development. I will expose *Lemna minor* (Common Duckweed) and *Lactuca sativa* (Lettuce) to half the accepted daily intake (for humans), the accepted daily intake, double the accepted daily intake, and triple the accepted daily intake of Cinnamon and Vitamin E over the duration of 4 days. I will then assess plant cell-wall integrity via microscopy. I hypothesize that the longer both plants are subjected to the over-the-counter medications, the more damage will be exhibited.

Sat- 13

Establishment and Growth of Trees Encroaching into a Boreal Peatland in the Central Adirondacks, New York State

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

Abstract - Boreal peatlands are a major carbon sink, of high biodiversity value, and serve as buffers to flood events following the occurrence of high levels of precipitation. Tree encroachment into peatland ecosystems is a leading driver of biodiversity loss, and may lead to losses of carbon stores and ecosystem function. Boreal peatlands located at their southern range limits may be more susceptible to climate warming. Shingle Shanty Forest Preserve, located in the central Adirondacks of New York State, is host to a large peatland complex (~1500 ha), and is home to numerous boreal plant species at their southern range limit. These plant species may be threatened by tree encroachment that has been exacerbated by nitrogen deposition and climate change over the past decades to centuries. The purpose of this study was to examine the timing of woody encroachment in different peatland community types. We utilized cores taken from trees within the peatland complex to investigate woody encroachment. We found that earliest encroachment of *Picea mariana* (Black Spruce; $n = 64$), *Larix laricina* (Tamarack; $n = 17$), and *Abies balsamea* (Balsam Fir; $n = 25$) into open bog communities dated to 152, 103, and 68 years ago, respectively. *Thuja occidentalis* (Eastern White Cedar; $n = 17$) encroachment, into fen communities dated to 182 years ago. Finally, the earliest Black Spruce encroachment into forested bogs dated to 231 years ago. Further study will assess timing of encroachment events and their relation to climate and deposition. In addition, we will model growth patterns (ring-widths) of encroached trees against climate and deposition variables to provide insight into how these factors are associated with both encroachment events and subsequent growth. We hypothesize that there will be an increase in encroachment and growth of trees over the past century due to anthropogenic warming and nitrogen deposition. This study has implications for management and conservation of boreal peatlands, where periodic disturbances (e.g., flooding, fire, logging) may be needed to ensure the conservation of vascular plants.

Sun- 21

Wetlands as Permanent Carbon Sinks in Fire-dependent Ecosystems

Makayla Tompkins (SUNY Plattsburgh, Plattsburgh, NY), **Troy Tetreault** (SUNY Plattsburgh, Plattsburgh, NY), and Mary Alldred (SUNY Plattsburgh, Plattsburgh, NY)

Abstract - Fire is an instantaneous modifier that can quickly influence biogeochemical cycles by altering soil properties and nutrient cycles. This study investigates the effects of a wildfire on the soil properties of a sandstone pavement pine barren (Natural Heritage S1G2) in Altona, Clinton County, NY. Immediately following the fire, managers determined that beaver pond and poor-fen wetlands served as natural firebreaks. We observed that wetland areas within the fire suffered less damage than the surrounding forest. In this study, we collected preliminary soil data on a large wetland complex at the edge of the burn. We established transects from the wetland edge into the forest on burned and unburned sites and collected soil samples at 4-m increments along the transects. We analyzed the soil samples to determine bulk density, moisture, organic content, and extractable nutrient concentrations. As expected, our results indicated significant losses of organic carbon in burned sites. However, we found that wetlands retained similar organic carbon stocks at burned and unburned sites. This result indicates that wetlands serve as permanent carbon sinks in fire-dependent ecosystems. In the future, we will investigate whether wetlands within the burn also served as permanent carbon sinks and whether the size of the wetland affects its ability to retain carbon during burn events.

Sat- 25

An Ecological Inventory of a Land Trust Property: The View From Mrs. Mayo's Farm II

Judith Tunstad (College of the Atlantic Island Research Center, Bar Harbor, ME), **Sage Fuller** (College of the Atlantic Island Research Center, Bar Harbor, ME, Lundy Stowe (College of the Atlantic Island Research Center, Bar Harbor, ME;), Hallie Arno (College of the Atlantic Island Research Center, Bar Harbor, ME), Addison M. Gruber (College of the Atlantic Island Research Center, Bar Harbor, ME)

Abstract - Conservation organizations require baseline ecological data in order to engage in appropriate stewardship and to evaluate change over time. The Maine Coast Heritage Trust (MCHT) Blue Horizons Property is a 28-ha (70-acre) former dairy farm located on the northwest side of Mount Desert Island, ME. Following MCHT's acquisition of the property in 2010, a very limited survey was performed. During the winter of 2018–2019, we conducted a more detailed ecological inventory, which included using game cameras to collect information on movements of large mammals and human activities, surveying forest types using variable circumference plots, performing a point-transect survey of the intertidal zone, cataloging cavity-nesting birds, and mapping geologic and man-made features. Common animals observed included *Odocoileus virginianus* (White-tailed Deer), *Canis latrans* (Coyote), *Vulpes vulpes* (Red Fox), *Dryocopus pileatus* (Pileated Woodpecker), and *Lepus americanus* (Snowshoe Hare). Some common trees on the site included *Picea* spp. (spruce), *Abies balsamea* (Balsam Fir), and *Betula* spp. (birch), as well as some *Fraxinus* spp. (ash) and *Tsuga canadensis* (Eastern Hemlock), which we mapped into a GIS. The intertidal zone is dominated largely by the seaweed *Ascophyllum nodosum* and contains *Littorina* spp. (periwinkles), assorted shellfish, and *Semibalinus balanoides* (Acorn Barnacle). The bedrock of the property is primarily Ellsworth Schist with some gabbro-diorite. We developed a historical and contemporary analysis of land use on the property and assessed the potential impact of *Canis lupus familiaris* (Domestic Dog) and human foot traffic on the property's wildlife. These data will facilitate MCHT's future management decisions for this property and other areas that they hold in trust. The project documents the current natural history of the site in the face of changes in land use and climate in the 21st century.

Sat- 59

Autumn Gut Contents of Allegheny Crayfish and Rusty Crayfish Introduced in Eastern Pennsylvania

Lakota V. Wadena (Bloomsburg University of Pennsylvania, Bloomsburg, PA), Sean M. Hartzell (Bloomsburg University of Pennsylvania, Bloomsburg, PA), and Thomas S. Klinger (Bloomsburg University of Pennsylvania, Bloomsburg, PA)

Abstract - Little information is available regarding the diet of crayfish populations within portions of the North Branch Susquehanna River drainage in Pennsylvania. As part of an ongoing study, we examined the gut contents of introduced but long established *Faxonius obscurus* (Allegheny Crayfish) and more recently introduced *Faxonius rusticus* (Rusty Crayfish) collected from adjacent tributaries of the North Branch Susquehanna River in early to mid-Autumn. While examining the gut contents with a dissecting microscope, we partitioned them into 4 broad categories for preliminary analysis: organic detritus, inorganic detritus, animal material, and vegetative (green) material. We found high proportions of organic and inorganic detritus in the guts of both species, with minimal amounts of animal and vegetative (green) material. Rusty Crayfish consumed a significantly greater proportion of organic detritus and a significantly lesser proportion of inorganic detritus than Allegheny Crayfish (chi-square test of independence: $x\chi^2 = 153.1$, df = 2, $P < 0.0001$). We found no significant relationship between body size (carapace length) and percent contribution of either organic detritus (Kkendall's rank correlation: z = -0.53741, $P = 0.591$) detritus or inorganic detritus (Kkendall's rank correlation: z = 0.83195, $P = 0.405$) consumed by Allegheny Crayfish. However, we found a significant (positive) relationship between body size of Rusty Crayfish and percent of organic detritus consumed (Kkendall's rank correlation: z = 2.4704, $P = 0.01$), and a significant (negative) relationship between body size and percent of inorganic detritus consumed (Kekandall's rank correlation: z = -2.2058; $P = 0.02$). Results presented here are preliminary. We are still actively collecting data from preserved specimens of these as well as other crayfish species in order to elucidate the diet of crayfish present within the region sampled.

Sun- 50

Morphology of *Junco hyemalis* (Dark-eyed Junco) in Western Massachusetts

Hannah Wait (Massachusetts College of Liberal Arts, North Adams, MA) and Daniel Shustack (Massachusetts College of Liberal Arts, North Adams, MA)

Abstract - *Junco hyemalis* (Dark-eyed Junco) is widespread songbird in North America. There are at least 15 subspecies in 5 distinct subgroups. The subspecies differ in various ways including morphology and migratory behavior. In eastern North America, there are 2 subspecies within the "slate-colored" junco group. The *J. h. carolinensis* subspecies is generally non-migratory, and occurs from the southern Appalachians north to, at least, western Pennsylvania. The exact northern distribution of *J. h. carolinensis* in unknown, but they are thought to intergrade with the *J. h. hyemalis* subspecies to the north. The *J. h. hyemalis* subspecies, likely the most abundant and widespread of all junco subspecies, is highly migratory and differs from the *J. h. carolinensis* subspecies based on bill color and wing size. We are attempting to determine if juncos in western Massachusetts are year-round residents, if they display altitudinal migration similar to *J. h. carolinensis,* or if overwintering juncos come from a more northerly breeding location. The first stage of our project is to compare individuals based on morphology. We captured juncos in western Massachusetts during all seasons in order to detect evidence of *J. h. carolinesis* traits in breeding, migrating and overwintering juncos. During capture of each bird, we recorded bill color, mass, wing length, tarsus, tail length, age, sex, and tail white. We also collected either breast feathers or a secondary feather for future isotopic analysis. We compared birds across these morphometric variables and season in order to quantify differences that might be related to migratory behavior. To date, we have only found *J. h. hyemalis* subspecies in our study area, and measurements from morphological variables overlap across seasons.

Sun- 4

Estimating White-tailed Deer (*Odocoileus virginianus*) Abundance Using Trail Cameras on Conserved Forest Lands

Rosalee P. Walter (Massachusetts College of Liberal Arts, North Adams, MA), Julie Richburg (The Trustees of Reservations, Florence, MA), and Daniel P. Shustack (Massachusetts College of Liberal Arts, North Adams, MA)

Abstract - *Odocoileus virginianus* (White-tailed Deer) is an herbivore that can be found foraging on a variety of vegetation throughout North America. At high densities, deer can negatively impact the ground vegetation by eating rare plants and assisting in the expansion of invasive plants. The purpose of this study was to estimate the abundance of White-tailed Deer in Mountain Meadow Preserve located in southern Vermont and northwestern Massachusetts. Over the course of 2 weeks, we deployed 6 baited trail cameras in 26 ha (65 acres) of the forested area of the preserve. Analytical methods used by other researchers produced unrealistically high deer estimates (e.g., >309 deer/km^2 [>800 deer/mi^2]). Detailed review of the footage produced a minimum number of 5 does, 3 fawns, and a single antlered deer, which still generates a high deer density (34 deer/km^2 [88 deer/mi^2]) compared to state biologists estimates (10 deer/km^2 [25 deer/mi^2]) from neighboring areas in Vermont and Massachusetts. However, there is a large degree of unquantifiable uncertainty in our estimates.

Sun- 23

Effects of Urban Land-Use Management on Hymenopteran Communities

Alexus Wang (University of Massachusetts, Amherst, MA), Desiree L. Narango (City University of New York, New York, NY), Christopher Neill (Woods Hole Research Center, Falmouth, MA), and Susannah B. Lerman (USDA Forest Service – Northern Research Station, Amherst, MA)

Abstract - As human populations increase, so does urban and suburban development, which can have widespread impacts on the abundance and quality of habitat for wildlife. Recent studies have highlighted global declines in pollinators and other insects; however, bees may be relatively abundant in suburban gardens where floral resources are provided. In addition, relative to other insects, there is little known about how wasps respond to differences in land uses within urban areas. Here, we compare the bee (Apoidea) and wasp (Aculeata including Sphecidae) communities among protected and residential land uses within the Boston, MA, metropolitan area. We collected bees and wasps using bowl-traps and sweep netting in 5 different land uses: interstitial parks, residual natural land, and 3 types of residential yards that differed in management styles (high-management, low-management, and wildlife-friendly). We then compared the difference in species richness and abundance of bees and wasps among land uses, as well as the correlation between bee and wasp abundance. Identification and analyses are ongoing; however, preliminary results suggest that different land uses in Boston have significantly different abundance and richness of bees. Parks and natural land had significantly fewer bee species and lower abundance than all 3 yard types. Yard types had similar species richness, but low-management yards supported the highest bee abundance. There were no differences in wasp abundance among land uses, and no correlation between bee and wasp abundance. Our results indicate that bees are positively affected by low-impact yard management activities, while suburban land uses may have no impact on wasp abundance. Diverse and abundant communities of hymenopterans appear to thrive in suburban areas; which in turn provides valuable ecosystem services like pollination and pest-control. Our future work will identify which species in the community benefit most strongly to suburban development and whether specific features of yards (e.g., plant diversity) drive bee and wasp diversity. Balancing resources for wildlife along with the needs and values of people will be key to advancing urban sustainability and biodiversity.

Sun- 32

Evaluating Reproductive Niche Characteristics of Federally Listed Houghton's Goldenrod to Approximate Range-wide Stability

Justine Weber (SUNY ESF, Syracuse, NY) and Donald J. Leopold (SUNY ESF, Syracuse, NY)

Abstract - *Solidago houghtonii* (Houghton's Goldenrod) is a Great Lakes endemic that is often locally abundant but is limited to a small region along the Niagara Escarpment. Approximately 80 populations occur in Michigan and Ontario, and 1 population occurs in western New York. This species is federally listed as threatened, state-listed as threatened in Michigan and endangered in New York, and is a species of concern in Canada. While the species is generally uncommon, there may now be enough protected Houghton's Goldenrod populations to meet the federal recovery criterion, and it may be appropriate to consider the species for delisting from federal protection. However, more data are needed regarding long-term trends within and across populations. As part of a range-wide study on Houghton's Goldenrod, we collected field and greenhouse data to evaluate reproductive niche characteristics of the species. Incorporating reproductive data into the niche-modeling process results in a more sound understanding of persistence likelihoods—not just necessary survival conditions, but also those necessary for reproduction. We are developing an index for likelihood of population persistence using population size, fecundity metrics, and the habitat characteristics associated with both. Results from our study will be applied in estimating stability of Houghton's Goldenrod across its range.

Sat- 15

Habitat Selection by a Presumed Extirpated Population of Eastern Hognose Snakes

Rose M. West (St. Lawrence University, Canton, NY;), Jeremy Feinberg (Smithsonian Institution, National Museum of Natural History and Conservation Biology Institute, Washington, DC), and Kristine Hoffmann (St. Lawrence University, Canton, NY)

Abstract - Urban development results in the depletion of habitat for many snake populations. *Heterodon platirhinos* (Eastern Hognose Snake) was thought to be extirpated from Long Island, NY, until a population was rediscovered in 2002 on the forest/sub-urban edge of the town of Upton. Thereafter, a radio-telemetry study monitored 16 snakes between 2003 and 2005 at Brookhaven National Laboratory. We are using Geospatial Information Systems (ArcGIS) to evaluate selection of soil type, vegetation, and slope by a post hoc comparison of habitat used by the snakes to available habitat. We expect our results to give greater insight into the Eastern Hognose Snake's spatial ecology at the third order and into how the population persisted and avoided detection on a crowded island with a strong herpetological history.

Sat- 48

Preliminary Results of a Common Garden Experiment with *Asclepias syriaca* (Common Milkweed)

Julia Whalen (Bridgewater State University, Bridgewater, MA), Heather Marella (Bridgewater State University, Bridgewater, MA), and M. Caitlin Fisher-Reid (Bridgewater State University, Bridgewater, MA)

Abstract - Got Milkweed? is a collaborative network of K–12 and university researchers throughout the range of *Asclepias syriaca* (Common Milkweed). Based out of St. Olaf College in Minnesota, the objective of this project is to study local adaptation using a common garden approach for populations of Common Milkweed throughout their range. Bridgewater State University (BSU) joined this project in the Fall of 2017. We collected milkweed seeds from a local meadow and sent these to the network coordinators. We received back seeds from our meadow, plus those from 3 other network locations. In May, 2018, we planted greenhouse-started seedlings in 2 plots, each plot containing 5 individuals from each of the 4 locations. We measured plants at their initial outdoor planting in May, and again in September. Here, we present preliminary results of differences in growth between seed source locations and plots. There was no significant difference in seedling growth between plots. However, there were various differences in growth between seeds sourced from different locations. In May, on the day of transplant from greenhouse to field, Minnesota seedlings were significantly taller (stem height) than the other locations' seeds and Massachusetts seedlings had significantly larger leaf length and width compared to Ohio seedlings. By September, after 4 months in the field, these initial greenhouse advantages were not observed. There was no significant difference in stem height among locations, and there were no significant differences between Massachusetts and Ohio in a variety of traits (total leaf number, stem diameter, largest leaf length, and largest leaf width). In November, all plants in Plot 2 were treated with soluble endomycorrhizae. We will continue to monitor these gardens for a minimum of 3 years, studying the effects of the mycorrhizae and tracking differences in plant growth and reproduction.

Sat- 14

Assessing the Persistence of Fisher (*Pekania pennanti*) in a Fragmented, Suburban Landscape in Albany, NY

Daniel Winters (SUNY Albany, Albany, NY) , Dan Bogan Ph.D. (Siena College, Loudonville, NY), and George Robinosn Ph. D. (SUNY Albany, Albany, NY)

Abstract - *Pekania pennanti* (Fisher) populations are gradually expanding across New York State as forest habitats recolonize much of the undeveloped areas of the east coast The Fisher has long been studied as a species expected to persistence in coniferous and mixed-forest habitats. Studies also show that Fishers are sensitive to habitat fragmentation, development, and some management procedures that often occur in forests across North America. Yet, in the eastern US, some research has shown evidence that Fishers are possibly persisting in forest habitat that is impacted by anthropogenic development and management. This research is designed to gather additional evidence of Fisher persistence and habitat selection in a landscape that is very different from the remote forests that Fishers are often associated with. We completed a pilot study in the Albany Pine Bush Nature Preserve (APBP) in Albany, NY, using camera traps to survey for Fisher occurrence. The first objective was to attempt to detect Fisher in 3 different habitat cover types located within the preserve using latency to detection (LTD) and probability of occurrence (OCC) measurements. The 3 cover types were the *Pinus rigida* (Pitch Pine)/*Quercus ilicifolia* (Scrub Oak) barrens, Pitch Pine/hardwood mixed forest, and *Robinia pseudoacacia* (Black Locust)/hardwood mixed forest. The second objective was to test 3 different lure setups in combination with the cameras to understand which, if any, lures were possibly having a lower LTD and higher OCC value than the others. The 3 lure types were a skunk musk lure, a visual fishing spoon hung from fishing line, and no lure. We deployed a total of 18 cameras using random strata sampling. 6 cameras per strata/habitat, 2 stations with each lure type within each habitat. The survey ran for 43 trap nights. We set the cameras to take photos at an interval of 2 seconds per shot with a 5 second delay after 5 consecutive shots. After the survey, we identified 11 total Fisher detections. All detections were in the Black Locust mixed forest habitat. The lowest LTD value (days) was 0.1, whereas the highest was 9.56. The lowest OCC was 0 for 17 stations without detections. The highest OCC was 0.12. Two of the visual lure stations had the highest OCC value, and 1 no-lure station had the lowest LTD value. These results suggest that the Black Locust/hardwood mixed forest patch of the APBP has the highest occurrence of Fishers in the preserve. This study also suggests that the visual lure works best to attract Fishers.

Sun- 39

Deer Abundance Impacts on Biogeochemical Cycling along an Urban-to-Rural Gradient in the Hudson Valley

Brendan Wirth (Vassar College, Poughkeepsie, NY) and Lynn Christenson (Vassar College, Poughkeepsie, NY)

Abstract - Human activity in the Hudson Valley, including urbanization, agricultural development, and predator removal, has isolated and destroyed habitat for many organisms, altering ecosystem composition and function. In turn, biotic changes have impacted soil characteristics and biogeochemistry that further influence these ecosystems. Specifically, land-use practices and predator removal have allowed *Odocoileus virginianus* (White-tailed Deer) to become abundant. We have been monitoring how deer interact with local forests by using paired fenced (to exclude deer) and unfenced (allowing deer) plots located throughout the Hudson Valley at sites affiliated with the Environmental Monitoring and Management Alliance (EMMA) network. We predicted that deer would alter forest biogeochemical cycling of carbon (C) and nitrogen (N) over a 5-year period. We collected soil samples from 4 of the 8 EMMA locations and analyzed them for nitrate (NO_3^-) and ammonium (NH_4^+), potential mineralization and nitrification rates, microbial biomass and respiration, moisture, pH, and total C and N content. We found that deer did not have a significant impact on biogeochemical cycling; rather, site location was significantly correlated to biogeochemical cycling in this 5-year period. These data suggest that the mature forest canopy at each location is currently the dominant regulator of biogeochemical cycling. We may, however, see the effect of high deer abundance on biogeochemical dynamics after a longer period of time.

Sat- 28

Climate Adaptation Planning for the Hoosic River Coldwater Fishery

Cassandra A. Wright (MCLA, North Adams, MA), Jordan Teixeira (MCLA, North Adams, MA), Noah M. Henkenius (MCLA, North Adams. MA), Elena Traister (MCLA, North Adams, MA), Lauren Stevens (Hoosic River Watershed Association, Williamstown, MA), Dick Schlesinger (Hoosic River Watershed Association, Williamstown, MA)

Abstract - Climate change, among other anthropogenic disturbances, is currently threatening the integrity of many coldwater systems. We evaluate how these stresses are currently impacting coldwater fisheries within the Hoosic River watershed and what threats climate change could have on this system in the future. Using GIS analysis, an examination of the particular threats to the Hoosic coldwater fishery, and examples of climate adaptation plans for other freshwater systems, we propose strategies for increasing the resistance and resilience of the Hoosic River coldwater fishery to climate change.

Sun- 55

Marking Technique for Northern Barrens Tiger Beetle (*Cicindela patruela*) Adults

McKenzie Wybron (SUNY ESF, Syracuse, NY), Melissa Fierke (SUNY ESF, Syracuse, NY), Dylan Parry (SUNY ESF, Syracuse, NY), and Matthew Schlesinger (NY Natural Heritage Program, Albany, NY)

Abstract - The *Cicindela patruela* (Northern Barrens Tiger Beetle) was rediscovered in 2004 at Sam's Point Preserve, Ulster County, NY. This beetle was historically present at 6 locations in the Hudson Valley, but is only known to be currently found at Sam's Point Preserve. We implemented a 2-year mark–recapture study to determine the population dynamics of this rare beetle. A white, oil-based, extra-fine-point Sharpie paint pen was used to create a unique dot code using 8 spots placed dorsally on the elytra in 2017. Unfortunately, these marks were fading and lost throughout the marking period. I developed a new marking technique for the 2018 season. This technique had marks made from a small piece of Rite-in-the-Rain paper (hole punch cut in half) with numbers written on it. There were no signs of marks lost or faded using this technique.

Sat- 1

Recovery of Diverse Flora After Control of Japanese Knotweed Monoculture

Casey Yamamoto (Marist College, Poughkeepsie, NY), Erik W. Anderson (Marist College, Poughkeepsie, NY), and Richard S. Feldman, Ph.D. (Marist College, Poughkeepsie, NY)

Abstract - *Fallopia japonica* (= *Polygonum cuspidatum*) (Japanese Knotweed) has been controlled for 6 years at 2 sites in the Marist College nature preserve. One site utilizes cutting down the plants repeatedly as a control measure, while the other utilizes the digging up of rhizomes. We hypothesize that such control will allow recovery of plant species diversity, with the prevalence of species dependent upon soil moisture and texture, and upon the seed bank. During 2018, we completed plant species cover surveys and soil characterization. We conducted stratified random sampling of vegetation with a 1-m^2 quadrat frame and used reference squares of known percent area of the quadrat to help estimate species coverage. In August, 23 species occupied the digging site, with knotweed comprising 18% of cover; whereas in the adjacent control area it comprised 100% of cover. The cutting site in August was occupied by 17 species, with knotweed comprising 52% of cover. Transect analysis shows that knotweed is restricted to 45 m of the 95 m total, with several species co-occurring with it. It comprised 11–13% of total cover in June and August, the greatest percent cover of 48 species found on the transect. Other species are common elsewhere on the transect, especially where tree canopy is denser. Both methods of controlling knotweed are allowing for species recovery, with digging suppressing knotweed to a greater extent than cutting and allowing more species to recolonize. Species occurrences will be related to soil moisture and texture.

Sun- 34

You are What You Eat and Where You Live: How Territory Size and Diet Relate to Mercury Concentration in Riparian Songbirds

Alexa Youre-Moses (SUNY Purchase, Purchase, NY), Allyson Jackson (SUNY Purchase, Purchase, NY), Stephen Harris (SUNY Purchase, Purchase, NY), and Batya Nightingale (SUNY Purchase, Purchase, NY).

Abstract - Background/Questions/Methods
Mercury (Hg) is a pollutant that has become a large threat to many ecosystems and the organisms that live within them. Mercury is a known neurotoxin that can cause extensive central nervous system damage, which can impact the behavior and survival of many species. Inorganic mercury is often deposited into the atmosphere by anthropocentric sources and can easily enter water sources through precipitation. These inorganic forms of mercury are then methylated by phytoplankton or bacteria in anoxic environments, creating an organic form of mercury called methylmercury (MeHg). Methylmercury accumulates in individuals and easily moves up through the trophic levels. As a result, the bioavailability of methylmercury in anoxic environments becomes a pressing issue within aquatic food chains. Riparian songbirds, due to their mixed diet and the fact that they occupy both aquatic and terrestrial habitats, are often used to monitor methylmercury availability within these environments, but very little is known about how territory location can influence Hg exposure. Songbirds and other insectivores are exposed to mercury through emergent aquatic prey, which act as a biological vector of methylmercury. The goals of this study were to 1)to record territory size and location for a suite of riparian songbirds and to, 2) sample songbirds to test for individual Hg exposure. and 3) use DNA metabarcoding of fecal samples to understand what the birds were eating.

Sun- 11

Display Behaviors in Encounters Between Males of the Ant-Mimicking Spider *Myrmarachne formicaria*

Jacqueline Zhou (SUNY Geneseo, Geneseo, NY) and Jennifer Apple (SUNY Geneseo, Geneseo, NY)

Abstract - *Myrmarachne formicaria* are ant-mimicking jumping spiders that are native to Europe and Asia and have recently been introduced to North America. Typically, these spiders exhibit behavior that mimics ants, such as tapping their front legs during pauses while walking, which imitate ant antennae. However, when 2 males encounter one another, they break out of this behavior and initiate what we have dubbed dueling displays. This dueling consists of 2 males moving side-to-side, facing each other, and raising their abdomens. Sometimes they are observed to unfold their chelicerae, bring their front pair of legs up into the air, and more aggressively confront their male opponent. Often these duels end with one male seemingly the winner as the other male decamps. In other members of the jumping spider family Salticidae that engage in forms of male–male display, it has been observed that the winner of a confrontation remains in the territory in which the interaction took place, while the losing individual retreats and finds shelter elsewhere. This result gives the victorious male access to the females in the territory. The goal of this study was to investigate this dueling behavior to ascertain (1) if size has a significant role in determining the winner of a duel, and (2) if there are behavioral indicators as to which spider will win a duel. We collected spiders for this study in Livingston County, NY, and took close-up images of them using a chill-table to keep the spiders motionless. We then analyzed these images using ImageJ to measure overall body and chelicerae length. We subsequently sorted the spiders into small vs. large size classes to be arranged into duel pairings that included 2 spiders that were either closely matched in size or from different size classes. We recorded the apparent winners from each of these duels. Larger spiders seem to prevail in the majority of the duels. Ultimately, assessing the roles of size and aspects of display behavior in determining the outcome of confrontations between males will aid in characterizing the mating behavior of these spiders, for which little natural history is known.

Sat- 8