2026 Northeast Natural History Conference
Oral Abstracts

Listed in alphabetical order by first-listed presenting author. Authors in bold are the presenting authors. Code at the bottom of each abstract indicates when in the conference schedule the presentation will be given: Day-Session-Room-Presentation # (thus, for example, Sun-AM2-B-4 indicates the presentation will be the 4th presentation in Room B in the Sunday Morning II concurrent session time slot).

A Landscape Inventory and Assessment of Londonderry, VT's, Town Lands

Greta Aiken (UVM, Burlington, VT – Field Naturalist Program)

Abstract - From May through August 2025, I partnered with the Londonderry, VT, Conservation Commission to inventory and assess their Town Lands. I approached this project from a traditional UVM Field Naturalist Program standpoint, which seeks to integrate a landscape's layers—including geologic influences, plant communities, wildlife occurrence, and human activity—into a cohesive story about that landscape's past, present, and future possibilities. Londonderry's Town Lands consist of 7 diverse parcels covering 101 ha (250 ac) of wetlands, uplands, riparian lands, and recreational areas. Londonderry benefits from uncommon natural communities, a low level of invasive plant species colonization, and a thoughtful, volunteer-run conservation commission committed to bolstering the ecological integrity of their corner of the state.

Sun-AM1-E-2

Using iNaturalist and Community Science to Document Invasive Species and Biodiversity

Michael E. Akresh (Department of Environmental Studies, Antioch University New England, Keene, NH), Amanda M. Katzer (University of Kansas, Lawrence, KS), Erin E. Boydston (US Geological Survey, Thousand Oaks, CA), Jennifer S. Briggs (Colorado School of Mines, Golden, CO), Kelsey Cooper (Indiana University, Bloomington, IN), Vijay Barve (Florida Museum, Gainesville, FL) , Lena Lee (National Park Service, Thousand Oaks, CA), and Toni Lyn Morelli (US Geological Survey, Amherst MA)

Abstract - iNaturalist has become one of most widely used community science platforms. Researchers have published thousands of articles worldwide in the last decade using iNaturalist data, and the network has been used for education, science communication, land and biodiversity management, and conservation. In addition, the use of bioblitzes, where focused efforts document biodiversity in a particular area and timeframe, have been increasing as a complementary approach with iNaturalist to better understand biodiversity on specific lands. As a representative case study, we documented biodiversity and conservation insights from iNaturalist observations during the US National Park Service (NPS) 2016 Centennial Bioblitz. Community scientists recorded over 19,000 iNaturalist research-grade observations from 107 national parks throughout the country. Many of the observations confirmed species that were listed in already-existing NPS species lists, though some observations recorded new species or previously unverified species. One key finding was the documentation of new or already-present introduced and invasive species in national parks during the NPS BioBlitz. Introduced species were recorded more often in national parks closer to cities, and parks closer to cities also drew more participants. Our study shows how public participation through iNaturalist and bioblitzes can facilitate biodiversity monitoring and be used for early detection of invasive species and prompt rapid management responses. iNaturalist is one of the best tools to document biodiversity across varied taxa in public lands, and can also be used in private lands, in the local Northeast region and throughout the world.

Sat-AM2-E-1

Sleeping Beauty: An Examination of the Effects of Hibernation on Diseases of *Bombus impatiens* (Common Eastern Bumblebee)

P. Alexander Burnham (University of Vermont, Burlington, VT), **Samantha A. Alger** (University of Vermont, Burlington, VT), Emily May (Xerces Society, Portland, OR), and Leif Richardson (Xerces Society, Portland, OR)

Abstract - The persistence of bumblebee populations depends on the successful overwintering and colony founding of queens, yet little is known about the hibernation ecology and pathogen dynamics of overwintering bumblebees. We characterized the overwintering conditions and pathogen profiles of *Bombus impatiens* (Common Eastern Bumblebee) queens at a naturally occurring hibernation site in Vermont. Using field observations, RT-qPCR, and microscopy, we compared pathogen prevalence and load of queens collected before and after hibernation. Over 200 excavated soil holes indicated a high density of overwintering queens, with an average hibernation depth of 6.48 cm in sandy soil. Queens occasionally shared burrows or clustered within close proximity. We detected 3 pathogens: *Nosema* spp., Deformed Wing Virus (DWV), and Black Queen Cell Virus (BQCV). While pathogen prevalence did not differ significantly between pre- and post-hibernation queens, *Nosema* spp. loads were significantly lower and BQCV loads marginally lower in post-hibernated queens, suggesting potential overwintering-related pathogen attrition. Our findings provide novel insights into the overwintering biology of bumblebee queens and the role of hibernation in shaping pathogen dynamics. This work contributes to the limited body of research on bumblebee overwintering ecology and highlights the need for further investigation into environmental and physiological factors influencing queen survival and spring emergence.

Sun-AM2-B-5

The Bryophyte Conservation Alliance: A New Initiative to Conserve the Bryophytes of North America

Mandy Slate (Ohio State University, Columbus, OH), John Brinda (Missouri Botanical Garden, St. Louis, MO), John Atwood (Missouri Botanical Garden, St. Louis, MO), Scott Schuette (PA Natural Heritage Program, Pittsburgh, PA), Ben Carter (CA Fish and Wildlife, Bishop, CA), Wes Knapp (Center for Plant Conservation, Wildomar, CA), Juan Carlos Villarreal (Laval University, Quebéc City, QC, Canada), Amanda Eberly (NatureServe, Arlington, VA), Eric Shershen (Ohio State University, Columbus, OH), and **Dorothy Allard** (Lyndonville, VT)

Abstract - Bryophytes, including mosses, liverworts and hornworts, play essential roles in ecosystems through their impact on soils, nutrient cycling, plant community dynamics, and overall biodiversity. Despite comprising roughly 10% of the North American flora and exhibiting high sensitivity to environmental change, bryophytes remain largely overlooked in conservation planning. This lack of awareness and action leaves many species increasingly vulnerable to emerging environmental threats. To address this need, the Bryophyte Conservation Alliance (BCA) has formed as a new continent-wide collaboration dedicated to advancing the conservation of North American bryophytes. As an initial step toward establishing regional and continent-wide conservation priorities, the BCA has organized 7 regional working groups tasked with standardizing bryophyte species lists for each state and province. This coordinated, regionally driven effort provides the first foundational framework for identifying and prioritizing bryophyte conservation needs across North America.

Sun-AM1-B-1

Longitudinal, Relationship-Centered Ecology Education: Tracing Youth Engagement Across Contexts

Ashley Alred (Cary Institute of Ecosystem Studies, Millbrook, NY)

Abstract - Many ecology education programs emphasize single experiences, yet limited research examines how repeated, relationship-rich engagement across contexts shapes learner development. This exploratory study traces youth participation in a continuum of place-based ecological experiences—from schoolyard inquiry to field trips, summer camp, teen leadership, and research—to examine how sustained involvement influences ecological literacy, confidence in scientific practices, and connection to place. Findings inform innovative, inquiry-based pedagogy designed to foster long-term engagement across developmental stages.

Sat-PM2-A-3

Our Campus Ecosystem: Volunteered Geographic Information as an Educational Tool and Valuable Dataset

Michael Amato (University of Massachusetts Amherst, Amherst, MA), Aliza Fassler (University of Massachusetts Amherst, Amherst, MA), and Justin C. Roch (University of Massachusetts Amherst, Amherst, MA)

Abstract - Volunteered geographic information (VGI) platforms like iNaturalist and eBird provide critical information about the biodiversity within a given landscape that is hiding in plain sight. In a campus setting, this information provides insight into not only what species exist on campus, but where students and community members are observing or interacting with them. For roughly a year, we have been experimenting with promoting the campus community at UMass Amherst to collect more VGI data, mapping VGI data for inclusion in Bee Campus USA materials, and using VGI data as an educational tool in landscape architecture studio projects on campus. This presentation provides a brief glimpse of how VGI has been used in and outside of the classroom as an educational tool, while simultaneously providing critical information about campuswide interactions with nature. It further advocates for wider promotion and adoption of VGI platforms in university settings and illuminates how VGI datasets may inform new campus planning and sustainability interventions.

Sat-AM2-A-5

Nest Site Selection in Herring and Great Black-backed Gulls: Is Shore Front Real Estate Important?

John Anderson (College of the Atlantic Island Research Center, Bar Harbor, ME)

Abstract - Populations of large gulls (*Larus* spp.) have been declining sharply around the northern North Atlantic basin. Proposed reasons for this decline include loss of food, increased predation, and human disturbance of nesting and loafing areas. We have studied nesting *Larus smithsonianus* (American Herring Gull) and *Larus marinus* (Great Black-backed gull) on Great Duck Island, ME (44.1550°N, 68.2499°W), since 1999. During that period, the great majority of the island's gull population has moved to within close proximity of the island field station. From the very first year of study, certain areas have consistently been "hot spots" with high densities of nesting gulls. As the number of nests in the south end of the island has increased from an initial count of 98 nests in 1999 to over 800 in 2025, these hot spots have persisted, enlarged, and been joined by new spots in additional areas. Overall, habitat does not seem to be a limiting resource, but the birds are crowding into relatively small areas. I examine possible reasons for this crowding and conservation implications.

Sat-AM1-B-1

River Conservation Opportunities in Northeastern Vermont: A Scoping Study of Wild and Scenic River Designation

Ben Applegate (University of Vermont, Burlington, VT)

Abstract - Partnership Wild and Scenic River designation is a federal program that supports locally led conservation of regionally significant rivers. Vermont currently has 1 such designation, along the upper reaches of the Missisquoi River. The Memphremagog Watershed Association has identified the Clyde River as a potential candidate for similar recognition. This presentation summarizes an initial scoping assessment that evaluates community interest and identifies the river's outstandingly remarkable values to determine whether pursuing a comprehensive eligibility study under the federal Wild and Scenic Rivers Program is warranted.

Sun-AM1-E-1

Arthropod Community Composition Along an Open-to-Forested Gradient in a Boreal-Temperate Ecotone Within a North American Peatland

Anne Brucker Arnold (SUNY Plattsburgh, Plattsburgh, NY), Mark Lesser (SUNY Plattsburgh, Plattsburgh, NY), Stephen F. Langdon (Borealis Consulting, Saranac Lake, NY), and Michale Glennon (Adirondack Watershed Institute, Paul Smiths, NY)

Abstract - Within the boreal-temperate ecotone (BTE), boreal peatlands represent a unique and important ecosystem for regional biodiversity. Further, within these peatlands, fine-scale changes in structure and composition along open-to-forested gradients create differences in microclimate and microhabitat that may lead to increased biodiversity at small spatial scales. Arthropods are a critical part of this biodiversity and may vary at the community level over relatively small spatial scales, thus making them an important indicator of how ecosystem structure and function changes along this gradient. The objectives of this study were to identify arthropods and compare arthropod community composition along the open-to-forested gradient in relation to vegetation structure and composition (overstory and understory). The study was situated in a peatland complex at Shingle Shanty Research Station and Preserve in the western Adirondacks of New York State. We establisned 27 plots spanning the open to forested gradient in May 2023. We collected structural attributes along with overstory and understory composition data at each plot and sampled arthropods once a month from May to September 2023. We used 4 collection methods (Lindgren funnels, Berlese traps, ground sweep, and aerial sweep) to maximize arthropod diversity in the sampling. We identified arthropods to family and determined diversity and richness for each peatland zone (open, transition, forested). Non-metric Multidimensional Scaling showed a clear pattern of changing community composition along the gradient. We used indicator species analysis to determine significant habitat associations. *Phoridae* (humpbacked flies) were significantly associated with the forested peatland zone. *Cixiidae, Caliscelidae, Cicadellidae* (plant hoppers and sap suckers), *Dolichopodidae* (long-legged flies), *Chloropidae* (grass flies), and *Thomisidae* (crab spiders), were significantly associated with the open peatland zone. *Salticidae* (jumping spiders) were indicators for the transition zone. Further analysis will determine which vegetation structural and compositional attributes most influence these differences. Understanding arthropod diversity along this gradient, as well as within a southern boreal peatland as a whole, is important as ongoing environmental change is both a threat to open peatland environments (due to tree encroachment) and a threat to the long-term persistence of boreal peatlands in the BTE.

Sun-AM2-C-4

Tracks and Taps: Wildlife Habitat and Presence in the Sugarbush at Proctor Maple Research Center

Naya Banerjee (University of Vermont, Burlington, VT), Jill Bubier (Mount Holyoke College, South Hadley, MA), Sophie Mazowita (University of Vermont, Burlington, VT), James Murdoch (University of Vermont, Burlington, VT), Emma Griffith (University of Vermont, Burlington, VT), Teaghan McAllister (University of Vermont, Burlington, VT), Ainsley Redd (University of Vermont, Burlington, VT), Walt Regan-Loomis (University of Vermont, Burlington, VT), Garrett Simon (University of Vermont, Burlington, VT), Sophie Williams (University of Vermont, Burlington, VT), and Tim Rademacher (University of Vermont, Burlington, VT)

Abstract - Maple sugaring infrastructure is common in northeastern hardwood forests, yet its effects on wildlife habitat, presence, and movement are not well understood. We studied wildlife–infrastructure relationships in a 73-ha (180-ac) working and research sugarbush at the Proctor Maple Research Center in Underhill, VT. Working in the field on multiple scales, we used plot-based surveys to quantify vegetation structure, wildlife sign, habitat features, and tubing characteristics to study associations between these variables. We paired these data with camera trapping and track surveys designed to capture wildlife movement and behavior beyond fixed plots at the landscape scale. Focusing on *Odocoileus virginianus* (White-tailed Deer), *Alces alces* (Moose), and *Ursus americanus* (American Black Bear), we aimed to provide more insight into how sugarbush management interacts with wildlife habitat, presence and movement in one example of a large sugaring operation in Vermont.

Sat-PM1-E-1

The Teaching Gardens: Where Science and Literacy Meet

Valerie Bang-Jensen (Saint Michael's College, Colchester VT) and **Mark Lubkowitz** (Saint Michael's College, Colchester VT)

Abstract - The Teaching Gardens were designed and implemented by Saint Michael's College students, led by a collaboration between professors in the Biology and Education Departments. Each of the 4 garden (Books in Bloom, Native Plants, International Garden, and Word Garden) serve to support various scholarly projects and also push the boundaries of the definition of "garden". The gardens invite play, study, and physical involvement. Join us for a tour exploring the 4 gardens and the role they play on campus in various disciplines, from the humanities to the sciences.

Sat -PM2-F-6

LiDAR-based Delineation of Boreal Peatland Transition Zones

Mark Baran (SUNY Plattsburgh, Plattsburgh, NY), Olivia DeVito (SUNY Plattsburgh, Plattsburgh, NY), Annie Arnold (SUNY Plattsburgh, Plattsburgh, NY), Steve Langdon (Shingle Shanty Preserve and Research Station, Long Lake, NY), and Mark Lesser (SUNY Plattsburgh, Plattsburgh, NY)

Abstract - Vegetation structure within peatlands spans a gradient from fully forested, closed-canopy to treeless, open-canopy environments. Differentiating and quantifying the distribution of habitats along this gradient is essential for understanding biodiversity, habitat quality, and tree-encroachment patterns within peatland complexes. The intermediate positions, or transition, along this gradient, may be critical in these assessments, as these areas contain a unique combination of both open and forested structural attributes. However, traditional peatland delineations have only characterized forested and open habitat, ignoring the transition zone due to time and accessibility constraints or with unclear thresholds for demarking zones using remote sensing. Here, we used structural attributes (canopy closure, tree density, and canopy height) obtained from field-based plots at Shingle Shanty Nature Preserve and Research Station in the western Adirondacks of New York State as the basis of differentiating open, transition, and forested peatland zones. We used LiDAR (Light Detecting and Ranging)-generated canopy heights averaged across 25-m^2 cells centered around the ground-truthed plots to set zone thresholds (forested >3.34 m, open <0.93 m) which could be applied across the entire study area. This approach delineated 15% of the study area as transition zone, largely at the expense of open peatland area which decreased by 63% compared to the historic 2-zone delineation. Results show that while zones typically form continuous areas with transition separating open and forested polygons, small "islands" embedded within other zones create a more heterogeneous mosaic of habitat than expected. Results also demonstrate that this delineation technique may allow for tracking of ongoing tree encroachment that threatens open peatland environments.

Sun-AM2-C-3

The Distribution, Public Health Potential, and Biocultural Value of Urban Foraging in Syracuse, NY

Anna Beach (SUNY ESF, Syracuse, NY), Stewart Diemont (SUNY ESF, Syracuse, NY), Donald Leopold (SUNY ESF, Syracuse, NY), and Sudha Raj (Syracuse University, Syracuse, NY)

Abstract - Foraging has been an integral component of human food systems since time immemorial. In recent decades, urban foraging has emerged as an important method of material, socioecological, nutritional, and biocultural value. Few studies have quantified the yields available to foragers from the urban forest, or the value of foraged plants among marginalized groups. We used a mixed-methods approach to assess the accessible fruit yields of 4 urban taxa in Syracuse, NY: *Crataegus* spp. (hawthorns), *Malus* spp. (crabapples), *Prunus serotina* (Black Cherry), and *Prunus virginiana* (Chokecherry), and to document the value of urban foraged plants among new American residents. Field studies show that these taxa have significant public health potential through the provisioning of essential antioxidant phytochemicals. Ethnographic data show that new Americans value foraged plants for a wide variety of purposes and actively seek ways to respond to barriers when confronted by limitations of their food sovereignty, pursuing opportunities that expand or maintain their sense of agency. These findings contribute to the call to systematically consider provisioning ecosystem services in the valuation and design of urban forests.

Sat-PM2-D-1

Implementing a Nationwide Mammal Monitoring Project on Martha's Vineyard

Silas Beers (BiodiversityWorks, Vineyard Haven, MA), Luanne Johnson (BiodiversityWorks, Vineyard Haven, MA), and Liz Olson (BiodiversityWorks, Vineyard Haven, MA)

Abstract - Snapshot USA is a national mammal-monitoring project that began in 2019 using crowd-sourced camera-trap data and an AI-driven photo-processing platform to track mammal distribution and abundance across North America. The camera traps are set, monitored, and collected in September and October by biologists and community scientists across all 50 states. Participating groups are now deploying 263 unique camera arrays, only 8 of which are in Massachusetts. BiodiversityWorks joined Snapshot USA in 2021 to begin long-term monitoring of mammals on the island of Martha's Vineyard, where several Massachusetts carnivore species are not present. Each fall, following the Snapshot USA methods for deployment, we set and tend 36-45 camera traps in 3 trapping arrays in 3 towns. We collaborate with 7th and 8th grade science students in 12 classes from 4 schools to promote STEM learning and career mentoring. Our camera traps collect at least 400 trap-nights of images, which we upload to Wildlife Insights where AI identifies mammals in the images. Students, volunteers, and our staff review the AI output and correct identifications where needed. Our camera traps have captured images of 9 of the 16 terrestrial mammal species known to be present on the island and 22 species of birds. The data are included in an annual journal publication with all collaborators as co-authors. BiodiversityWorks' cost to run these camera-trap arrays, work with science students and volunteers, and finalize the data is $11,000 annually; however, an entirely volunteer-led effort to maintain a single array would be much less expensive.

Sat-AM2-E-5

Temperature-induced Stress Responses by Color Morph in the Eastern Red-backed Salamander

Arianna Berrios (SUNY Oneonta - SPARCnet RaMP) and Elizabeth Bastiaans (SUNY Oneonta, Oneonta, NY)

Abstract - As weather events and temperatures become more extreme and variable, amphibians are at high risk of population decline. *Plethodon cinereus* (Eastern Red-backed Salamander) is commonly known for its color polymorphism, but the proximate and ultimate factors behind that polymorphism are unknown. Corticosterone (CORT), the stress hormone in amphibians, can be quantified using dermal skin swabs and enzyme-linked immunoabsorbent assays. Previous work has found that the lead-back morph is more stressed and heat-tolerant than the red-back. While populations differ in morph abundance, they do not differ in stress levels. This study aims to determine whether stress levels (CORT) are affected by increased ambient temperatures. We sampled 3 populations across the Eastern Red-backed Salamander's range and measured stress levels upon collection and after exposure to a heat stressor (+6 °C). Understanding how polymorphic populations respond to climate change can improve our ability to predict how other systems will respond to climate change.

Sun-AM2-D-1

Exploring Complex Acoustic Signaling in Frogs: A Multi-Disciplinary Approach

Catherine R. Bevier (Colby College, Waterville, ME)

Abstract - Most frogs rely on acoustic signals during the breeding season for intraspecific communication. These signals are produced primarily by males to attract females or deter competing males, and vary from single note to complex multi-note calls. The latter include complex advertisement calls, where note order (compositional syntax) and how notes are pulsed or frequency-modulated may be informative to a receiver. My research team is using linguistic analysis, information theory and network analysis, and neuroscience tools to better understand how these complex signals are assembled and produced by a male frog, then perceived, processed, and acted upon by a male or female recipient. Results from playback experiments in the lab and in the field of 2 frog species in Maine, *Rana pipiens* (Northern Leopard Frog) and *Rana septentrionalis* (Mink Frog), suggest that male and female conspecifics pay attention to call type and note order.

Sat-AM1-D-2

Evaluating the Performance of Population Abundance Estimators with *P. cinereus* Count and Spatial Recapture Data

Audrey M. Blanchard (US Geological Survey, Turners Falls, MA, Bridgewater State University, Bridgewater, MA), Elise Edwards (US Geological Survey, Turners Falls, MA), and Evan Grant (US Geological Survey, Turners Falls, MA)

Abstract - Abundance estimation plays a key role in wildlife ecology studies and conservation management, aiding in population monitoring efforts and providing information on population dynamics. However, different data types and associated models may produce different estimates, making it challenging to compare among studies. Count surveys are fast and can produce abundance estimates using "N-mixture" models but are known to overestimate abundance. Spatial capture–recapture (SCR) surveys collect more detailed information on the capture locations of marked animals, and SCR models produce a reliable estimate of density; however, this approach requires substantially more time and effort. There are trade-offs that make each survey, data type, and model useful for estimating population density, but each model may produce different estimates with the same data. Our aim is to compare estimates from N-mixture and SCR models to determine how to translate results between them and increase the reliability of count models. We expect that the differences in the observation-process portions of each model will result in different density estimates, which may scale with population abundance. Using *Plethodon cinereus* (Eastern Red-Backed Salamander) as a study species, the results of this study will expand our ability to compare different data types from across their range.

Sun-AM2-D-5

Leveraging Conservation Detection Dog Surveys to inform New England Cottontail Conservation in NYS

Arden Blumenthal (New York-New Jersey Trail Conference, Mahwah, NJ)

Abstract - *Sylvilagus transitionalis* (New England Cottontail [NEC]) is the only rabbit native to the US east of the Hudson River, but decades of competition with over *Sylvilagus floridanus* (Eastern Cottontail [EAC]) and habitat fragmentation have caused dramatic range contraction. Once abundant across New York State, the species is now listed as a species of greatest conservation need. Research in New York suggests NEC may hold a competitive advantage over EAC in areas with *Kalmia latifolia* (Mountain Laurel) and *Vaccinium* (blueberry) understory—habitat types that are both mappable via remote sensing and potentially useful for targeting survey effort. However, the cryptic nature of the species makes traditional surveys extremely labor-intensive, limiting biologists' ability to generate reliable statewide abundance estimates. To provide a high-efficiency survey option for estimating NEC distribution, density, and abundance, New York–New Jersey Trail Conference Conservation Dogs Program has partnered with NYS DEC to deploy conservation detection dogs (CDDs) for NEC pellet detection. This presentation reports results from 2 survey seasons (2023–2024 and 2024–2025), during which 3 CDDs surveyed ~554 ha (~1368 ac) across 28 survey days in predicted high-quality habitat. In total, the team collected 49 pellet samples. Of these, 32 (65.3%) were confirmed as NEC via DNA analysis. Operational efficiency improved markedly from year 1 (0.94 detections per day) to year 2 (1.42 detections per day) following expansion from 1 dog to 3 dogs. Spatial analysis of DNA results reveals genuine NEC-EAC co-occurrence within the survey area, and NEC strongly associated with Mountain Laurel-dominated understory. Handler field assessments showed strong predictive accuracy when samples were flagged as suspected EAC. This presentation will discuss survey methodology and operational lessons learned in the context of addressing the broader challenge of surveying high-quality habitat across the landscape with the goal of supporting more accurate abundance estimates and strategic conservation interventions.

Sun-PM2-E-4

From Misunderstood to Marvelous: Connecting People to Nature Through Insects on a University Campus

Aliza Boles Fassler (University of Massachusetts, Amherst, MA), Michael Amato (University of Massachusetts, Amherst, MA), Nicole Bell (University of Massachusetts, Amherst, MA), Axel Boy (University of Massachusetts, Amherst, MA), Jen Konieczny (University of Massachusetts, Amherst, MA), Susannah B. Lerman (USFS Northern Research Station, Amherst, MA), and Justin C. Roch (University of Massachusetts, Amherst, MA)

Abstract - Insects often incite fear and revulsion. Yet they are foundational to ecosystems supporting our food, clean air, clean water, natural beauty, and healthy soils. Insect pollinators are also everywhere offering a way for people to connect with nature on university campuses. Hands-on activities that engage students in pollinator stewardship can shift fear to curiosity while building community. In fall 2024, the University of Massachusetts Bee Campus Committee formed with the goal of joining the national Bee Campus USA program sponsored by the Xerces Society and engaging the broader University of Massachusetts community in support of wild pollinator conservation. By collaborating with University of Massachusetts landscaping staff and student clubs, we installed a native pollinator garden with >2700 native plant plugs. In our first year, we held 9 outreach events with the University of Massachusetts community. In this presentation, we highlight lessons learned from a Bee Campus USA program during its first year. We describe outreach activities that reached an estimated 450+ participants and discuss approaches for integrating pollinator habitat stewardship into an introductory university course.

Sun-AM2-F-3

Wild Bee Foraging Behavior and Nutritional Ecology in Urban Gardens

Rachael E. Bonoan (Providence College, Providence, RI), Alexa Pudlo (Providence College, Providence, RI), Gracey Sorensen (Providence College, Providence, RI), Margaret Ritchie (Providence College, Providence, RI), and Claire Crowther (Providence College, Providence, RI)

Abstract - Insects provide ecosystem services such as pollination, decomposition, and support of food webs. Unfortunately, many insect populations are declining, or at risk of decline. Although urbanization has led to habitat fragmentation, a main driver of decline, cities could bolster insect-pollinator conservation. If designed properly, unused greenspace in parks, along roadways, etc. can support healthy pollinator populations. Pollinators visit flowers for food—nectar provides carbohydrates; pollen provides proteins and fats. Since 2021, we have tracked wild-bee foraging behavior in - urban gardens (Providence, RI). In this longitudinal study, we are investigating how foraging is influenced by nutritional content of floral resources, and temporal shifts (April–October) in floral availability. Surprisingly, bees preferred flowers with high amino acid content in nectar, and high carbon content in pollen. Based on general nutritional content of nectar/pollen, this finding is the reverse of what we expected. Regarding temporal variation, nutritional value among focal gardens is unbalanced throughout the year. Thus, bees must travel long distances to achieve a balanced diet. Over 2 field seasons, we examined behavioral differences between nectar and pollen foragers, and conducted a mark–recapture study to determine how far bees can travel. These data will inform conservation-focused greenspace design in cities, and have already been used to inform planting on Providence College's campus.

Sun-PM2-B-3

Framework for Assessing Expansion Potential in Rare Specialist Butterflies

Charlotte G. Brennan (Department of Natural Resources and the Environment, University of Connecticut, Storrs, CT), Chadwick D. Rittenhouse (Department of Natural Resources and the Environment, University of Connecticut, Storrs, CT), Shannon Kearnery (Connecticut Department of Energy and Environmental Protection, Wildlife Division, Burlington, CT), and Laura Saucier (Connecticut Department of Energy and Environmental Protection, Wildlife Division, Burlington, CT)

Abstract - Conservation planning for rare specialist butterflies requires a structured approach that integrates detection, habitat assessment, and population ecology to identify opportunities for range expansion. Using *Callophrys irus* (Frosted Elfin) in Connecticut as a case study, we present a flexible, transferable framework to assess expansion potential with 3 integrated components: (1) capture–mark–resight surveys that characterize abundance, dispersal, and fine-scale habitat use; (2) a tiered exploratory process that combines habitat modeling, vegetation assessments, and targeted occupancy surveys to expand large-scale distribution knowledge; and (3) a spatially explicit habitat expansion model that synthesizes habitat, distribution, and movement data to evaluate enhancement, restoration, and establishment opportunities around existing populations. The resulting management matrix translates modeled outcomes into actionable recommendations, offering a broadly applicable tool for advancing rare butterfly conservation across regions and taxa.

Sat-PM2-E-2

Comparing Field-feasible Cooling Methods for Working Dogs at Risk of Heat-related Illness

Molly Buis (University of Pennsylvania, Philadelphia, PA), Tess DeMarro (University of Pennsylvania, Philadelphia, PA), Amritha Mallikarjun (University of Pennsylvania, Philadelphia, PA), Meghan Ramos (University of Pennsylvania, Philadelphia, PA), and Cynthia Otto (University of Pennsylvania, Philadelphia, PA)

Abstract - Heat stress and heat stroke are a major preventable cause of illness and death in detection dogs, particularly during field work where conditions often limit the options for rapid cooling interventions for dogs. In a 9-condition crossover study of exertional hyperthermia in 12 working dogs, we tested four 1-minute cooling methods: partial water immersion, voluntary head dunk, controlled drinking, and wet head towel, using water at either 22°C (72 °F) or 15 °C (59 °F), compared to passive cooling. Temperature was monitored in three ways: an ingestible pill, a subcutaneous temperature chip, and an ear thermometer. When examining all methods of temperature acquisition as a function of cooling method in a multivariate mixed-effects model, partial water immersion was the most effective method, with 15 °C (59 °F) water cooling more rapidly than 22°C (72 °F) water. Voluntary head dunk and water consumption both led to rapid cooling. The water temperature had a limited impact on cooling with the head dunk, but consuming 22°C (72 °F) water led to more rapid cooling than consuming 15 °C (59 °F) water. The wet head towel was not an effective alternative to voluntary head dunk. In canine exertional hyperthermia, when signs of heat stress are recognized, activity should be terminated and active cooling initiated. When possible, total or partial immersion in cold water is recommended. Using combinations of voluntary head dunk and controlled cool water consumption also provides a safe, effective, and portable means of active cooling.

Sun-PM2-E-2

Engaged Learning in the Urban University Landscape

Jerry L. Burgess (Department of Earth and Planetary Science, Johns Hopkins University, Baltimore, MD), Katalin Szlavecz (Department of Earth and Planetary Science, Johns Hopkins University, Baltimore, MD), Daniel Viete (Department of Earth and Planetary Science, Johns Hopkins University, Baltimore, MD), and Ciaran Harman (Department of Earth and Planetary Science & Environmental Health and Engineering, Johns Hopkins University, Baltimore, MD)

Abstract - One of the goals of a vigorous and dynamic academic department is the ability to modify teaching pedagogy as students, science, and global endeavors evolve. Multidisciplinary field investigations have become part of our core curriculum, offering exciting alternatives to traditional learning. As our educational charges begin to investigate the more intractable topics of biodiversity loss, climate change, urban nutrient cycles, or tectonics in deep time our focus has shifted to active learning activities and living laboratories such as an urban campus setting. We have striven to use our environs as more than the sum of buildings and infra-structure to create unique problem based real-life, data-focused instruction. Using our urban campus as the educational template to promote active learning as a process of "doing science" with acquired knowledge and skills ultimately conceptualizing solutions or testing meaningful hypotheses. We present select case studies on courses that employed experiential learning to enhance students' capacity for identifying problems and proposing novel solutions in the context of avian diversity/loss, ecosystem science, forest ecology, urban geology and collisional tectonics, and watershed dynamics. Students valued the incorporation of operational aspects and methodologies into their education, as well as reflective opportunities provided through feedback and active experimentation. Course evaluations along with faculty experience and observation suggest that a holistic approach in undergraduate campus-based field courses broadens student experiences, enhances peer-based and collaborative learning, builds team-working skills, and fosters a curiosity about the natural environment and become active agents in the quest for scientific understanding.

Sun-PM2-F-2

Conspecific Attraction to Egg Masses Drives Communal Oviposition in a Vernal Pool Breeding Anuran

Alex Byrne (SUNY Oneonta, Oneonta, NY), Elizabeth Bastiaans (SUNY Oneonta, Oneonta, NY), and Daniel Stich (SUNY Oneonta, Oneonta, NY).

Abstract - Oviposition site selection is a critical determinant of reproductive success in amphibians, influencing embryonic survival and development. Communal oviposition, although uncommon among anurans, may confer thermal or antipredator advantages and provides a model for studying collective decision-making. In *Lithobates sylvaticus* (Wood Frogs) communal egg-mass aggregations are a striking feature of breeding ecology, yet the behavioral mechanisms driving their formation remain unclear. To test whether females use conspecific egg masses as social cues when selecting oviposition sites, we conducted manipulative field experiments across 12 constructed vernal pools. In 6 experimental pools, we translocated early egg masses from their original position, and in 6 control pools, we briefly moved egg masses and returned them to their original position. Females in experimental pools rarely reused the original oviposition sites, while those in control pools exhibited high original site reuse. Across all 12 vernal pools females were more likely to lay eggs next to an existing egg mass than expected under a model of random oviposition. Additionally, in a complementary mesocosm experiment, reproductive pairs were given a binary choice between ovipositing near an existing conspecific egg mass or in a neutral zone. Females deposited egg masses near conspecific eggs in 86% of trials, demonstrating presence of eggs serves as a social cue independent of chorus activity or environmental gradients. Collectively, these findings show Wood Frog females employ simple, socially mediated decision rules that give rise to emergent communal oviposition patterns.

Sat-AM1-D-3

Five Decades of Rescuing Cold Stunned Sea Turtles in Massachusetts

Eamon Caffrey (Mass Audubon Wellfleet Bay, Wellfleet, MA), Bob Prescott (Mass Audubon Wellfleet Bay, Wellfleet, MA), Karen Dourdeville (Mass Audubon Wellfleet Bay, Wellfleet, MA), and Mark Faherty (Mass Audubon Wellfleet Bay, Wellfleet, MA)

Abstract - For >50 years, Mass Audubon's Wellfleet Bay Wildlife Sanctuary (WBWS) has been at the forefront of rescuing cold-stunned sea turtles on Cape Cod beaches each winter. While many people associate sea turtles with tropical reefs and warm, coastal water, the increased warming of the Gulf of Maine means a proportion of juvenile *Lepidochelys kempii* (Kemp's Ridley Sea Turtle), *Chelonia mydas* (Green Sea Turtle), and *Caretta caretta* (Loggerhead Sea Turtle) are venturing further north to forage each summer in the Northwest Atlantic. Since 1974, WBWS volunteers and staff have rescued and recovered >11,000 cold-stunned sea turtles from Cape Cod Bay beaches, with as many as 1200 turtles stranding in a period of just 6 weeks. We discuss the history and success of the program, what we've learned throughout the years, and what can be done to continue to help these endangered and threatened animals survive to reach reproductive maturity with the goal of furthering their populations.

Sun-AM1-A-1

An Herbarium of Her Own at Barnard College in New York City

Hilary S. Callahan (Barnard College, Columbia University, New York, NY)

Abstract - Throughout the 1880s, proponents of women's education were establishing Barnard College as an affiliate of Columbia University (1889), while members of the Torrey Botanical Club (TBC) were advocating to charter and fund the New York Botanical Garden (1891). Many of these same men and women, young and old, professional and amateur, helped assemble this remarkable herbarium. Today, the Barnard College Botanical Laboratory herbarium holds >3300 specimens of 1783 taxa in 691 genera and 133 families. This past year, the collection was conserved, digitized and published to Symbiota. I will highlight 2 of BCBL's under-appreciated collectors. First is Dr. Laurence Johnson, M.D., whose >400 specimens in our herbarium augment perhaps 40 others, mostly at NY. He was a Civil War veteran who then trained at Bellevue Hospital Medical College, practiced privately throughout the city and served as Lecturer in Botany at the Medical College of the City of New York. His illustrated volume, *A Manual of the Medical Botany of North America* (1881), was part of a prominent medical textbook series. He collected avidly throughout NYC's outer boroughs and in Long Island, Westchester, and New Jersey. Fellow members of TBC likely arranged to transfer his personal herbarium to BCBL upon his death in 1893. Second and even more prominent is Sarah Louise (Rogers) Clarke. A member of TCB and respected bryologist, she was also a non-student participant in Barnard's Botany Club. Her vascular plant collection emphasized alpine flora, efforts across many summers in Europe with her daughter and son, many autumns in the Adirondacks, and several other trips in New Hampshire, Colorado, Georgia and Canada. Hundreds of her contributions are already aggregated in Bionomia.net, the on-line resource facilitating citation of collectors and collections. BCBL's holdings will more than double that, further reinforcing the value of her amateur passions.

Sun-PM2-C-2

Recovery Efforts for Karner Blues Benefits Frosted Elfins

Steven P. Campbell (Albany Pine Bush Preserve Commission, Albany, NY), Neil A. Gifford (Albany Pine Bush Preserve Commission, Albany, NY), and Alexandria Soldo (Albany Pine Bush Preserve Commission, Albany, NY)

Abstract - *Plebejus samuelis* (Karner Blue) is an endangered butterfly of pine barrens and oak savanna ecosystems. One of the few remaining populations of this species occurs in the Albany Pine Bush Preserve, which protects remnants of a northeastern interior pine barrens ecosystem in eastern New York. One of the ecological communities that comprise this ecosystem is the globally-rare inland *Pinus rigida* (Pitch Pine)–*Quercus ilicifolia* (Scrub Oak) barrens, which is a fire-adapted, early successional community that provides habitat for the Karner Blue. This community has been degraded by decades of fire suppression and species invasions, and its restoration is critical to Karner Blue recovery. In conjunction with state, private, and federal partners, we have been restoring inland Pitch Pine-Scrub Oak barrens using system-based management strategies that include removing invasive and overabundant native species, planting native species, mowing, and prescribed burning. We are also employing species-based management actions aimed directly at increasing the Karner Blue's population size, such as planting its host plant *Lupinus perennis* (Blue Lupine). To evaluate the effectiveness of these recovery efforts, we have been monitoring adult population size annually since 2007. Population size at our survey sites has increased from <1000 in 2007 to annual population sizes that are between 10,000–20,000 adults, indicating that we have restored a viable population of Karner Blues. Given the success with the Karner Blue, we were interested to see if our management is also benefiting *Callophrys irus* (Frosted Elfin), another rare butterfly species that relies on pine barrens and Blue Lupine. We started monitoring Frosted Elfin populations in 2025 at a subset of Karner Blue survey sites, and we estimated a population size of nearly 5000, suggesting that the Albany Pine Bush Preserve is also supporting a robust population of Frosted Elfins. Additionally, site-level abundance estimates for Karner Blues and Frosted Elfins were correlated, which further suggests inland pine barrens restoration is benefitting both Karner Blues and Frosted Elfins. We will continue to monitor both species to better understand the effects of management on their populations.

Sat-PM2-E-1

Evaluating Baseline Values and Spatial and Temporal Variation of "Forever Chemicals" in the Environment and in Bald Eagles (*Haliaeetus leucocephalus*) in Massachusetts

Jesse B. Caney (Antioch University, Keene, NH), Michael Akresh (Antioch University, Keene, NH), Chris DeSorbo (Biodiversity Research Institute, Portland, ME), Mark Strynar (Environmental Protection Agency, Durham NC), Micah Miller (Biodiversity Research Institute, Portland, ME) and Natalie Karouna (USGS Eastern Ecological Science Center, Laurel, MD)

Abstract - Perfluoroalkyl and polyfluoroalkyl substances, commonly known as PFAS or "forever chemicals", are a group of toxic anthropogenic chemicals that are used in a wide variety of applications. Selected for their water repellency and nonstick properties, these chemicals can be found in items such as cookware, fabrics, and personal care items. This ubiquitous usage makes PFAS largely unavoidable in our everyday lives. Their ability to persist and resist degradation allows these chemicals to move unaltered through our hydrologic cycle and make their way into the environment. The leeching of PFAS from products is one of the main ways they make their way into our environment. Another concerning avenue is the widespread use of biosolids in farming, and accidental releases from wastewater plants. Research has shown that exposure to these chemicals can result in adverse health effects in humans. While research concerning wildlife is still being conducted, results thus far have shown similar results. Wildlife situated at the top of the food chain serve as environmental indicators. The offspring of these species can give a snapshot of potential contamination of food sources within a given area. *Haliaeetus leucocephalus* (Bald Eagle) is a particularly useful study species due to its varied diet, position on the food chain, long rearing period and ease of access. The goal of this analysis is to look at that the hydrology within the state of Massachusetts. Particular focus is paid attention to the how the river systems connect to each nest site and potential foraging area. In addition, selecting rivers that originate from or pass through land covers of concern such as agricultural and industrial will give a glimpse into how these land usages are connected to PFAS values in the birds.

Sat-AM1-A-1

Pollinator Community Composition Varies Seasonally and Within Days in *Ipomoea purpurea*

Dorothy Christopher (Western Connecticut State University) and Drew Smith (Western Connecticut State University)

Abstract - Understanding local pollinator phenology helps to identify and facilitate the conservation of pollinator species and provide a framework to study future mismatches between pollinators and plants, as well as the ecological implications of these shifts. Studies on how pollinator-community composition varies over the course of a day and the seasonal frequency of foraging behavior are therefore of critical importance. We conducted observations of the pollinator community and visitation rates to the generalist-pollinated *Ipomoea purpurea*. Additionally, we quantified the contribution of individual pollinator species to seed set. We found that pollinator species reached peak abundance at different points in the summer. We also found differences in daily patterns of visitation. These results highlight the dynamic nature of plant–pollinator interactions. Future work will investigate how the pollinator community is impacted by climate change.

Sun-PM2-B-4

Probing the Here and the Now with Poets in the Field

Tammis Coffin (Finding Poetry in Nature, Lenox, MA)

Abstract - Poetry is a language of perception. I'd like to offer inspiration, guidance and encouragement for jotters-of-field-notes-that-might-be-poems. I'll share ongoing experiments (as writer, as educator) in cultivating poetic receptivity alongside scientific curiosity. I'll share examples from less well-known poet-naturalists. My intention is to support writing that reaches for sensory details with care and caring, with increasing fluidity and freedom. My commitment to cultivating poetic perception gained traction with a 2001 Master's Project on *Finding Poetry in Nature.* Discoveries continue to evolve while guiding community poetry projects at ecological, geological and cultural sites. Some projects and publications include *The Summit House Writers* with Massachusetts State Parks*, Spring Equinox in Weatogue Valley* for Bartholomew's Cobble National Natural Landmark, *Wabanaki Cultural Guide to Maine* with the Maine Indian Basketmakers*, The Natural & Cultural History of Maine's Cobble Beaches* at College of the Atlantic, and *The Rusticator's Journal* published by Friends of Acadia.

Sat-Am2-F-4

Art and Ecology at Saint Michael's College

Brian Collier (Saint Michael's College, Colchester, VT)

Abstract - For more than ten years, my Art & Ecology course has led students to use art to raise awareness about local and regional environmental issues and to create scalable, art-based projects that offer highly visible ecological benefits to the Saint Michael's College campus. Grounded in solid scientific research, these projects incorporate drawing, painting, sculpture, photography, and graphic design to produce interdisciplinary, student-generated, ecologically focused creative works. Following a research-and-practice model, students develop ideas and collaborate to manage projects from initial concept through public presentation. Because this course is cross listed between Art and Environmental Studies, the resulting projects provide models of interdisciplinary artwork that complement related work in Biology and Environmental Studies/Science courses. They also contribute directly to sustainable campus initiatives at our college.

Sun-PM2-F-5

Preliminary Investigation of Flying Squirrels (Genus *Glaucomys*) in the Natural Area of Saint Michael's College

Paul J. Constantino (Saint Michael's College, Colchester, VT), Rylee Burnham (Saint Michael's College, Colchester, VT), Travis Standerski (Saint Michael's College, Colchester, VT), and Lydia Altman (Saint Michael's College, Colchester, VT)

Abstract - The Natural Area of Saint Michael's College is a 138-ha (340-ac) parcel of wetlands, floodplain forest, sandplain forest, and open fields adjacent to campus. Since 2017, a significant effort has been made to reclaim the land from small-scale agriculture and gradually restore natural habitats. Part of this work has involved deploying trail cameras to characterize the existing biodiversity of the area, and 1 of those cameras captured an unmistakable photograph of a New World flying squirrel (genus *Glaucomys*). New World flying squirrels are nocturnal descendants of tree squirrels notable for the presence of a patagium used in gliding. Three species exist in North America, with 2 (*Glaucomys sabrinus* [Northern Flying Squirrel] and *Glaucomys volans* [Southern Flying Squirrel]) overlapping in the northeastern US. However, except for this initial photograph, we have no other evidence documenting the flying squirrels in this particular area. To learn more, we started a student-centered project aimed at collecting data on this population, with an initial goal of identifying which species is/are present. Students built squirrel nest boxes using designs provided by the Canadian Wildlife Federation. Because we did not know whether we have Northern or Southern Flying Squirrels, we built 3 boxes with specified dimensions for each species (6 boxes total) and installed them in suitable habitats based on information in the literature. We then installed trail cameras focused on the boxes to record any activity. Additionally, we have conducted a survey of natural tree cavities and dreys and established additional cameras on 4 of those natural potential nest sites. Initial data have confirmed the presence of flying aquirrels in this area, but we have yet to determine precisely which species is/are present. Our next step is to acquire fur from the nest boxes to use in genetic determination of species.

Sun-AM2-F-1

The IUCN Red List Assessment of Global Freshwater Snails: Status and Understanding of the Assessment Process

Jay Cordeiro (Bridgewater State University, Bridgewater, MA)

Abstract - Freshwater ecosystems are essential to global biodiversity and economic stability. Within these systems, freshwater mollusks—gastropods (snails) and bivalves (mussels)—play indispensable roles. They facilitate nutrient cycling, act as a food source for humans and wildlife, and provide natural water purification. Beyond these ecological functions, they hold cultural value, appearing in art and jewelry across various civilizations. Despite their importance, these organisms face a severe extinction crisis. A 2021 International Union for Conservation of Nature (IUCN) Red List assessment of 1500 freshwater mollusk species worldwide found that nearly one-third are threatened. Freshwater gastropods living in lotic (flowing water) systems are particularly vulnerable. Regional analyses consistently identify "prosobranch" snails as having the highest levels of threat, especially within the Nearctic, Palearctic, and Australasian realms. The primary drivers of this decline are pollution, damming, and water abstraction. While general trends point toward severe decline, our specific understanding of the threat level facing freshwater gastropods is largely outdated. In North America, the last comprehensive review by the American Fisheries Society occurred in 2013—nearly 13 years ago—revealing that 74% of species were imperiled. These data may now be too out of date to inform conservation policy. Furthermore, the 2021 IUCN Red List assessment relied on a Sampled Red List Index (SRLI). While the SRLI is a rigorous and cost-effective method for monitoring large or under-resourced groups by sampling 1500 representative species, it is inherently incomplete. It does not assess every species within the taxonomic group, highlighting a critical gap in site-specific data required for conservation planning. To bridge this gap, a global IUCN Red List assessment of all freshwater gastropods is currently underway, aiming for December 2026 completion. This initiative aims to modernize our understanding of extinction risks and refine the methodology for evaluating these species. I outline current understanding of the status of these species to date and describe the methodology used for the upcoming assessment, emphasizing the need for targeted, data-driven conservation efforts in newly identified priority areas. With this information, habitat protection efforts can be directed where they are most needed before more species disappear forever.

Sat-PM2-B-1

Cameras, Crowds, and Citations: Exploring Orchid-Insect Relationships via Fieldwork, iNaturalist, and Literature

Laura J. Costello (University of Vermont, Burlington, VT) and Desirée L. Narango (Vermont Center for Ecostudies, White River Junction, VT)

Abstract - Though orchids are renowned for the diversity of their pollination systems, much remains unknown about orchid–insect relationships—a critical conservation gap as both orchid and insect populations decline. I conducted focused field work on 1 species, *Platanthera dilatata* (White Bog Orchid), recording night-and-day insect visitation across an elevational gradient in Vermont using time-lapse cameras. I will share how the insect visitor assemblage changes with elevation and time of day and highlight several potential pollinators new to the literature. I also compared data from multiple sources (community science, biodiversity data aggregators, literature) and will share what each can tell us about orchid–insect relationships across a range of North American orchids.

Sat-PM1-E-3

The Invasive Plant Brigade: Building Community and Capacity for Invasive Plant Management

Richard Couse (BiodiversityWorks, Martha's Vineyard, MA), **Robyn Graygor** (BiodiversityWorks, Martha's Vineyard, MA), and Luanne Johnson (BiodiversityWorks, Martha's Vineyard, MA)

Abstract - In 2021, BiodiversityWorks launched the Natural Neighbors Program to increase native biodiversity and habitat connectivity across Martha's Vineyard by encouraging individuals and neighborhoods to incorporate landscape features that benefit plants, pollinators, and wildlife. The program emphasizes hands-on participation in biodiversity conservation, offering recommendations that meet landowners at their level of interest, ability, and available resources. Today, more than 400 private landowners participate in Natural Neighbors, advancing a long-term goal of transforming residential properties on the Island into ecological sources rather than sinks for biodiversity. The Invasive Plant Brigade (IPB) emerged from this work as a volunteer-powered labor cooperative that coordinates invasive plant removal services alongside outreach and education, addressing one of the most persistent drivers of habitat degradation on the Island. Through a time-exchange model, volunteers contribute hours removing invasive plants from another participant's property and earn equivalent assistance on their own land. Guided by trained staff naturalists, working groups gain hands-on experience identifying priority invasive species, safely using removal tools, and understanding the ecological and logistical considerations of invasive plant management. The IPB primarily focuses on infestations on private properties, empowering homeowners to regain control of their landscapes while reducing the spread of invasive species into surrounding natural areas. This presentation will examine the origins and structure of the IPB, lessons learned during implementation, and key challenges and successes. It will also offer a practical blueprint for establishing similar volunteer-based programs for managing invasive plants elsewhere, highlighting their potential to strengthen native biodiversity, community engagement, and climate resilience.

Sat-AM2-E-4

What Can Citizen Science Data Reveal About Red-Backed Salamander Phenology?

Sophia Cox (Pennsylvania State University, State College, PA), David Miller (Pennsylvania State University, State College, PA), and Carli Dinsmore (Pennsylvania State University, State College, PA)

Abstract - Anthropogenic disturbance such as climate change and urbanization can disrupt phenology across species, trophic levels, and ecosystems, with vital implications for species conservation. Citizen science, or public contributions to the scientific process, has long been an enormously valuable tool in ecological research, and analyzing citizen science data can reveal phenological patterns across broad spatial and temporal scales. *Plethodon cinereus* (Eastern Red-backed Salamander) is a widespread and abundant species with >80,000 observations on the global citizen science platform iNaturalist. Eastern Red-backed Salamanders are active on the surface during milder seasons (and therefore detectable by iNaturalist observers) and retreat belowground when conditions are too harsh, typically during winter and summer. In this study, we use Eastern Red-backed Salamander iNaturalist data, daily temperature and precipitation data, and long-term climate data to ask (a) under what range of conditions Eastern Red-backed Salamanders are active aboveground, (b) whether these phenological relationships vary by latitude or regional climate (indicating local adaptation), and (c) whether human land-use patterns shift or constrain these phenological relationships. We employ pseudoabsences and spatial-temporal thinning to account for sampling biases. Results show considerable variation in Eastern Red-backed Salamander phenology across latitudinal and climatic gradients. For instance, in regions with a cold and wet climate, the characteristic spring and fall peaks in Eastern Red-backed Salamander activity are seemingly reduced or nonexistent, with a lack of clear seasonal variation. In the warmest regions, activity during summer months is all but nonexistent. Early modeling of the range of temperature and precipitation conditions under which Eastern Red-backed Salamanders are active aboveground show a unimodal relationship between mean temperature and probability of Eastern Red-backed Salamander detection, with statistically significant differences driven by regional climate and latitude. Additionally, we evaluated impacts of human disturbance on Eastern Red-backed Salamander phenology. We show that iNaturalist data represents a valuable tool for illuminating patterns in phenology, an area of research with growing relevance in the face of accelerating environmental degradation.

Sat-AM2-D-5

Creating a Local Herbarium

Devon Cummings (Rockefeller State Park Preserve, Pleasantville, NY)

Abstract - I will explain the methodology of creating a local herbarium, including specimen collection, preparation, information gathering, database structure, digitizing, and uploading to Symbiota, thus producing a scientific floristic record for use in local management and the global scientific community. The approach used in the establishment and imaging of the herbarium at Rockefeller State Park Preserve (RSPP) provides a case study in how small organizations can make collections globally accessible for botanical study.

Sun-PM2-C-3

Mountain Ponds, Lake Phenology, and Aquatic Environmental Responses

Julia Daly (University of Maine – Farmington, Farmington, ME), Rachel Hovel (University of Maine – Farmington, Farmington, ME), and Stephanie Dykema (University of Maine, Orono, ME)

Abstract - In response to global environmental change, mountain lakes present a duality: they may act as highly susceptible sentinels of change, while simultaneously providing climate-change refugia across the landscape. As lakes experience shorter ice-covered periods and rising water temperatures, associated biological responses remain unclear. Here, we describe ice and temperature dynamics in small, remote mountain lakes in western Maine, and evaluate the role of elevation in supporting cold habitat conditions. We share the results of 15 years of high-resolution monitoring that illuminate how aquatic habitats and seasonal patterns of these lakes are controlled by a combination of landscape position, regional weather, and local watershed conditions. We found that, compared to lower-elevation sites, ice persisted on average 8 days longer and water temperatures warmed faster but maximum temperatures remained lower in high elevation (>500 m) lakes. Aquatic organisms reflected these differences, and high- and low-elevation lakes supported different zooplankton phenology and community composition. We also found that the mountain lakes hold “memory” of spring events like ice breakup and water column mixing through the summer and into the fall, indicating lingering ecological implications for changing phenology. These patterns suggest that subalpine mountain lakes with longer ice duration and cooler summer temperatures may serve as important climate-change refugia, even as they warm over time. These findings provide context to further explore interactions between water chemistry, temperature, and biological response in these mountain pond ecosystems.

Sun-AM2-E-

Split Rock Wildway: For Unusual Plant Communities as well as Wide-Ranging Animals

John Davis (Adirondack Council, Elizabethtown, NY)

Abstract - Split Rock Wildway is a swath of relatively intact forest, roughly coinciding with an eastward reaching band of anorthosite, connecting the Adirondack High Peaks with the Champlain Valley via the West Champlain Hills. Split Rock Wildway—now about half protected—was proposed 30 years ago as a wildlife corridor for wide-ranging mammals like *Lynx rufus* (Bobcat), *Ursus americanus* (American Black Bear), and *Pekania pennanti* (Fisher), but it turns out to be important for dry-rich site plants and diadromous fish, too. It has many examples (some protected) of the *Quercus* (oak)–*Carya* (hickory)–*Ostrya virginiana* (Amercian Hophornbeam) communities documented by the Northern Forest Atlas Project, and is a focal area for landlocked *Salmo salar* (Atlantic Salmon) recovery work.

Sun-PM2-D-3

The Paleobiogeography and Extinction of Spinocyrtid Brachiopods in Central and Eastern North America (Western Laurussia) During the Upper Devonian

James (Jed) Day (Department of Geography, Geology and Environment, Illinois State, Normal, IL)

Abstract - Late Devonian (Frasnian) epeiric and continental margin marine benthic shelly faunas of western Laurussia reached peak cosmopolitanism in central and western North American carbonate and clastic deltaic shelf systems along the length of the Appalachian Foreland Basin in eastern North America. Oxygenated middle and deep benthic shelf systems were dominated by distinctive clades of atrypid, spiriferid, rhynchonellid, and strophomenid brachiopod taxa. Prior to the invasion of cosmopolitan Old World Realm taxa in the latter part of the mid-Givetian, the faunas in the Eastern Americas Realm basins were characterized by endemic clades of cyrtospiriferoid brachiopods of the Family Spinocyrtididae. Early and mid-Givetian shelly faunas in the Illinois and Michigan basins included species of *Spinocyrtia*, *Mediospirifer*, and *Orthospirifer*, with the first 2 well known in the Appalachian Basin Hamilton Group fauna. *Eosyringothyris* had its first appearances in the upper part of the mid Givetian in both the Appalachian and Iowa basins but disappeared from the Appalachian Basin during the Taghanic biocrisis. In the Upper Givetian and Lower Frasnian, the *Orthospirifer* and *Eosyringothyris* persisted as important elements of central North American carbonate-platform faunas. *Orthospirifer* migrated into western Canada but was extinct there by the end of the lower Frasnian. Prior to its extinction in the Iowa Basin carbonate-platform southern shelf area at the end of the lower Frasnian, *Orthospirifer* migrated into the Appalachian basin where it occurs as fossils in mid-upper Frasnian deposits of the Catskill Delta. In the Iowa basin, *Orthospirifer* gave rise to *Platyrachella* during the Middle Frasnian. *Platyrachella* suffered extinction during the Lower Kellwasser Extinction crisis and *Orthospirifer* underwent extinction in the Appalachian Foreland Basin at that time.

Sat-PM1-F-1

A Paleoecological Investigation into the Origins of the UVM Natural Areas Program's New Peatland, Joe's Pond-Morrisville

Emily DeAlto (Field Naturalist Program, University of Vermont, Burlington, VT)

Abstract - I conducted a paleoecological investigation of Joe's Pond–Morrisville, a 4-ha fen within a larger wetland complex of bogs, swamps, and marshes, to reconstruct changes in biological communities and hydrologic conditions since the late glacial period. I collected >100 peat-depth measurements across the fen and extracted a 6-m peat core for plant macrofossil analysis. I integrated these data with historical aerial imagery and landowner accounts to interpret long-term peatland development and more recent landscape change. Results indicate that peat accumulation began in a lake and expanded inward creating a floating mat over open water. Over the last 80 years, however, *Castor canadensis* (North American Beaver) activity has shifted the dominant peat-accumulation process toward paludification, promoting wetland expansion into adjacent uplands and contributing to a transition within the peatlands from being forested to an open fen. These findings demonstrate how long-term autogenic and allogenic processes and contemporary ecosystem engineering interact to shape peatland structure and function.

Sat-PM1-E-4

A Butterfly Atlas of Maine and the Canadian Maritime Provinces

Phillip deMaynadier (Maine Department of Inland Fisheries and Wildlife, Augusta, ME), John Klymko (Atlantic Canada Conservation Data Centre, Sackville, NB), Ronald Butler (University of Maine at Farmington, Farmington, ME), Herbert Wilson (Colby College, Waterville, ME), and John Calhoun (McGuire Center for Lepidoptera and Biodiversity, Gainesville, FL)

Abstract - Butterflies constitute a diverse and ecologically important component of our northeastern natural heritage, and yet a comprehensive assessment of their distribution and status was mostly lacking in the Acadian region (Maine, New Brunswick, Nova Scotia, Prince Edward Island), until now. Over a period of 15 years (2003–2017), we compiled modern and historical butterfly data using separate and complementary approaches: (a) collation of existing records from museums and private collections, scientific publications, and online databases; (b) targeted professional surveys for species of conservation concern; and (c) coordinated community science surveys via the Maine Butterfly Survey and the Maritime Butterfly Atlas. Both the Maine and Maritime atlas projects shared simple goals: (i) improved scientific understanding of the Acadian region's butterfly fauna, and (ii) increased public appreciation of the biology and conservation needs of butterflie, and other pollinators. Much of this talk will focus on specific highlights from the results of investigations in Maine, where the number of confirmed butterfly records grew from ~9000 to 32,500 (>250% increase), including dozens of new county records, 11 new state records, and 1 new US record: *Papilio brevicauda* (Short-tailed Swallowtail). Final results of the Maine-Maritime atlasing efforts are now available in an illustrated book (Butterflies of Maine and the Canadian Maritime Provinces published by Cornell University Press, Ithaca, NY).

Sat-PM2-E-5

Millimeter by Mllimeter: Assessing Fine-scale Growth Trends of Black Spruce in a Southern Boreal Peatland

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

Abstract - Boreal peatlands represent 83.3% of all global peatlands. At their southern range limits, they contribute to regional diversity by providing habitat for species otherwise only found further north. However, ongoing shifts in climate and hydrology threaten these ecosystems, particularly at their southern limits. Previous studies based on tree rings have shown that increased temperatures have impeded annual *Picea mariana* (Black Spruce) growth. Annual-scale climate-growth responses, however, can mask more complex relationships occurring at finer-temporal scales. Our objective was to understand intra-annual growth of Black Spruce within southern boreal peatlands across an open to forested gradient. Specifically, we aimed to identify growth onset, cessation, and rates across the growing season. Further, we aimed to determine how position along the open to forested gradient affects growth. To study these factors, we used point-dendrometers that record tree growth by measuring changes in radius at hourly intervals. In June 2025, we deployed 36-point-dendrometers at Shingle Shanty Preserve and Research Station, a large boreal peatland complex located in the western Adirondacks of New York State. We placed dendrometers on 6 trees along each of 6 randomly located transects spanning the open to forested gradient. Weekly growth varied from 0.0 mm to 11.2 mm, while average growth rate varied from 0.0005 to 0.12 mm/week across the growing season. Average growth rates varied by month, with the lowest growth rate of 0.0003 mm/month occurring in June and the highest growth rate of 0.094 mm/month occurring in September. Growth was significantly higher in forested versus open sites ($P < 0.01$). Dendrometers remain deployed and will continue to collect data through the 2026 growing season, which will improve confidence in our conclusions and enable growth comparisons across years. Our research will provide insight into fine-scale climate–growth responses of Black Spruce at their southern range limit. Climate change is expected to influence both Black Spruce and the larger boreal peatland environment, making it crucial to obtain a baseline understanding of growth responses. Such information can help predict shifts in boreal peatland structure and aid in best management strategies for the ecosystem and species within them.

Sun-AM2-C-5

Conservation Detection Dogs as a Tool for Wood Turtle (*Glyptemys insculpta*) Monitoring in Maine

Sequoia Dixson (University of Maine/Absolute Breeze Conservation K9s, Orono, ME)

Abstract - *Glyptemys insculpta* (Wood Turtle) is listed as a species of special concern in Maine and as endangered by the International Union for Conservation of Nature. The species is undergoing population declines throughout its range from causes that include collection for the pet trade, road mortality, climate change, and habitat loss. Given these widespread declines, developing tools and approaches to efficiently monitor populations is critical. Accurate population size and demographic estimates rely on high detection rates across all age classes; however, Wood Turtles are a cryptic species and inhabit environments that are difficult for humans to navigate. Additionally, the small size of hatchlings and juveniles make them especially difficult to detect. In this study, I evaluate the effectiveness of conservation detection dogs in increasing Wood Turtle detection rates during standardized surveys. Data includes 123 one-kilometer surveys conducted throughout Maine in 2022 and 2023 during which a detection dog was present on 40 of these surveys. These surveys were part of a large-scale effort by the Maine Department of Inland Fisheries and Wildlife to assess Wood Turtle population levels across the state. Specifically, I compare canine detection rates to the human detection rates, with particular focus on age class of turtles (hatchlings, juveniles, and adults) and time of year (spring, summer, and fall). Employing a conservation detection dog may increase overall detection rates to bolster population-size estimates, help locate younger individuals to avoid biased sampling efforts, and extend the field season into the summer months to maximize limited time and resources. Conservation detection dogs may increase detection and help locate younger individuals improving population estimates. Understanding the effectiveness of conservation dogs to detect cryptic and at-risk species is important for the long-term conservation of species.

Sun-PM2-E-6

How Diet and Energetics Drive Fine-scale Demographic Variation in the Eastern Red-backed Salamander

Lan T. Do (Ohio Wesleyan University, Delaware, OH), Ella M. Neuenschwander (OWU, Delaware, OH), Ariana Brown (OWU, Delaware, OH), Brooklyn Upp (OWU, Delaware, OH), Devon X. Haley (OWU, Delaware, OH), Brittney C. Parks (OWU, Delaware, OH), Bryan H. Juarez (OWU, Delaware, OH), Maggie M. Hantak (University of Dayton, Dayton, OH), and Eric J. Gangloff (OWU, Delaware, OH)

Abstract - Life-history traits, including growth rates, timing of maturity, and reproductive output, are closely tied to fitness and, by extension, population dynamics. Identifying sources of variation in life-history traits is therefore crucial for explaining how and where species can become established or persist. For example, the external environment influences life-history trajectories through factors determining energy intake, such as prey availability and activity times. As an exemplar model species, *Plethodon cinereus* (Eastern Red-backed Salamander) exhibits life-history variation across its broad geographic range, but also at a fine scale. Here, I present a study testing how diet composition and energetics may drive life-history diversity found in replicate Ohio salamander populations in mature and successional forests, which differ in canopy cover and temperature profiles due to historic differences in land use. At sites where we have capture–mark–recapture and morphological data spanning nearly a decade, we collected stomach contents of both adult males and females through gastric lavage. This technique provides high-quality DNA samples, with which we used a metabarcoding approach to quantify the prey taxa consumed. Further, we will measure energy content of the consumed food directly via bomb calorimetry. We predict that prey diversity and available prey energy will be higher in the stomach contents of successional forest salamanders, which exhibit faster growth rates and reduced time to sexual maturity. This result would support the hypothesis that diet and energetics are drivers of life-history and demographic variation at a fine geographic scale. We can leverage these data to understand how Eastern Red-backed Salamander responds to historical and contemporary land use, which provides a foundation for understanding the responses of other species, including many at-risk amphibians.

Sat-AM2-D-2

Assessing Conservation Ranks for all of Maine's Tracheophytes

Eric Doucette (Maine Natural Areas Program, Augusta, ME)

Abstract - Collectively, Maine's official list of threatened and endangered plants, as well as current and older versions of our Tracking list, represents data and NatureServe Conservation ranks (S-ranks) for under 400 Tracheophyte species. Conservation ranks for most of the State's native flora have not been assessed. A current project using expert opinion and a quantitative data-driven approach is assigning S-ranks to all native Tracheophyte taxa at all taxonomic levels. Recent taxonomic and nomenclatural changes, coupled with historic lack of data at the infra-taxon level introduce difficulty, yet the resulting list will serve as a baseline for conservation of Maine's Tracheophytes.

Sat-PM1-C-1

The Effects of Climate-Induced Shifts in Water Column Temperature on Calanoid Copepod Population Health and Predator Presence at Mount Desert Rock, Maine

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Abstract - The waters surrounding Mount Desert Rock (MDR), a remote island 40 km off the coast of Maine, are a prominent location for nutrient upwelling and high phytoplankton productivity. Historically, the area has also been cited as a hotspot for high-caloric-value copepods *Calanus finmarchicus*, and their predators, including *Eubalaena glacialis* (North Atlantic Right Whale). While not the leading cause of population decline in North Atlantic Right Whale, reports of animals in poor body condition (both live and deceased) indicate that inadequate nutrition may be a factor, as well as a driver of changes in spatial distribution. Sightings of North Atlantic Right Whales from the Blair Marine Research Station at MDR have decreased significantly in the past decade, possibly because climate-induced changes in oceanographic regime are reducing local productivity. In this study, we examine the role of changing oceanographic productivity as a factor in decreased North Atlantic Right Whale sightings. During each summer field season 2019–2025, we studied changes in zooplankton productivity at 3 locations varying in depth and bathymetry in feeding grounds around MDR, collecting weekly plankton tows and CTD profiles from each site. From 2019 to 2024, we found a significant increase in mean sea surface temperature of 1.8 °C. The average percentage of *Calanus* spp. collected per sample declined annually. We also analyzed individual copepods for their prosome and lipid sac size, finding a significant decrease in stage V *Calanus* spp. prosome length from 2019 to 2023. In this study, we correlate these changes with longitudinal observational surveys of cetacean presence, including North Atlantic Right Whales, that have been conducted at MDR during the summer field season for the past 40 years. Continuing collection of these 2 longitudinal data sets will provide insight to the effect of climate-induced shifts in zooplankton productivity on local North Atlantic Right Whale presence.

Sat-AM2-B-4

Canine-assisted Survey Teams for Detecting Eastern Box Turtles in Natural Habitats

Scott Egan (AECOM, Manchester, NH)

Abstract - Dogs have worked alongside humans for thousands of years, traditionally as working dogs for hunting and herding and as guardians and companions for their human counterparts. As humans began to recognize the extraordinary olfactory abilities of dogs, the types of jobs became more diverse and highly specialized. Detection dogs, trained to locate specific scents, are being used increasingly in the field of conservation and have become widely accepted as critical tools for biodiversity monitoring, invasive species management, ecological research, and environmental consulting. For example, detection of *Terrapene carolina* (Eastern Box Turtle) in nature is hindered by habitat selection, cryptic coloration and patterns, and secretive behaviors, which in turn hinders scientist's ability to locate, study and protect these animals. Therefore, in 2005, I began conducting canine-assisted turtle surveys to more effectively and efficiently locate turtles in preparation of large-scale development programs. Compared to human surveyors alone, detection dogs have demonstrated higher detection probabilities and greater efficiency over large landscapes and are better at finding turtles buried in the leaf-litter or under dense shrub thickets. Canine-assisted surveys benefit science and conservation of the species by improving our ability to build study populations for scientific research programs, better understand habitat use and home range relative to the site, identify critical habitats, direct conservation measures, and aid in pre-construction tracking and relocation efforts to avoid direct impacts to individual animals.

Sun-PM2-E-3

Using Natural History Collections to Investigate Past and Present Carnivore Diet in the Northeast

Claire Ellerbrook (Middlebury College, Middlebury, VT), Max Zeltsar (UC Riverside, Riverside, CA), David Needle (New Hampshire Veterinary Diganostic Laboratory, University of New Hampshire, Durham, NH), Megan Munis (New Hampshire Veterinary Diganostic Laboratory, University of New Hampshire, Durham, NH), and Alexis M. Mychajliw (Middlebury College, Middlebury, VT)

Abstract - Mammalian carnivore communities in the Northeast have experienced dramatic changes in distribution and identity over the past few centuries, from extirpations to new arrivals. Identifying these shifted baselines is vital to accurate management planning but is only possible through the use of historical data sources, including natural history collections. We performed stable isotope analysis (δ13C, δ15N) on historical skulls, skeletons, and skins of *Canis latrans* (Coyote), *Vulpes vulpes* (Red Fox), *Urocyon cinereoargenteus* (Gray Fox), and *Pekania pennanti* (Fisher), and compared them with samples taken from present day populations to track changes in carnivore diet and land use over time. We found that Coyotes, Red Foxes, and Gray Foxes exhibit significant niche overlap in Vermont to a degree higher than other communities across North America, potentially linked to the relatively recent expansions of canids following the extirpation of *Canis lupus* (Wolf). Stable-isotope mixing models revealed individual specialization across populations that could be linked to human–wildlife conflict. I will synthesize these lessons on the benefits and challenges associated with using natural history collections in mammalian carnivore studies and highlight the potential of their practical application in broader contexts.

Sat-PM2-C-5

Willoughby: A Vermont Geobotanical Marvel

Brett Engstrom ()

Abstract - Willoughby—a long, deep lake sitting in a trough embraced by precipitous cliffs on both sides—is a geologically unique place in Vermont's Northeast Kingdom. Contacts between the lime-rich metasedimentary country rock and granite intrusions set in such a steep-walled valley between medium-high mountains provides for a wide array of edaphic conditions, both rock-based and soil-based, and an unusual diversity of natural communities and plants. Where one can find rare boreal to arctic *Saxifraga* (saxifrages) growing with *Toxicodendron* (poison ivy) at the base of wet calcareous cliffs; krummholz-like *Thuja occidentalis* (Northern White Cedar) growing out of vertical cracks on shear cliffs; and cliff-brow limy outcrops with dense, low thickets of sapling *Acer saccharum* (Sugar Maple)–*Sorbus americana* (Mountain Ash)-and *Corylus avellana* (Hazelnut)-covered with *Clematis occidentalis* (Western Purple Clematis). A most unusual old and gnarly low Sugar Maple-rich forest sits perched on the summit of Mount Pisgah on the northeast side of the lake. Exposed mineral soil of colluvial sand, gravel, and rocks found at the base of the calcareous cliffs are home to yet more typically far northern species of grass, sedge, crucifer, and legume. A band of mature and undisturbed rich northern hardwood forest, mixed in places with cedar, *Tsuga* (hemlock), and even a few *Quercus rubra* (Northern Red Oak), cloaks the base of the very steep colluvial slope almost down to the lakeshore.

Sun-PM2-D-2

The Urban Lichen Toolbox

Ann M. Evankow (Drexel University, Philadelphia, PA), Jenny Mann (Drexel University, Philadelphia, PA), Jeremy Howell (CUNY, New York City, NY), James Lendemer (NY State Museum, Albany, NY), and Jason Munshi-South (Drexel University, Philadelphia, PA)

Abstract - Most people see lichens everyday without noticing them. Once you begin to look more closely, lichens grow in nearly every environment that has light and a stable surface. In cities, lichens grow on trees, sidewalks, metal, and other various substrates. We use common urban lichens as models to study urban ecology and evolution. For this research, we combine various tools varying from community science datasets to whole genome sequencing. We will discuss how some of these various tools can be used and applied by anyone, including local environmental educators, land managers, and teachers. We will also discuss how we use these accessible tools to help plan and carry-out our more complex urban ecology and evolution questions.

Sat-AM1-E-4

Using Side-scan Sonar and Spatial Analysis to Characterize Habitat for Aquatic Species Conservation

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Abstract - Habitat data for large rivers are sparse, partially due to access challenges and resource limitations, but are critical for understanding distributions of aquatic species and the underlying drivers. Hydroacoustic tools can mitigate these challenges by providing reach-scale mesohabitat information in large river systems while reducing the time and expenses necessary for traditional surveys (e.g., SCUBA, EPA Physical Habitat Field Protocol, Wolman pebble count, etc.). We provide 2 case studies of side-scan sonar habitat mapping and its applications to aquatic species conservation in the Connecticut River. First, we assessed drivers of mesohabitat use and identified potentially suitable mesohabitats for a rare freshwater mussel, *Lampsilis cariosa* (Yellow Lampmussel). Using a generalized linear model, we predicted high probabilities of Yellow Lampmussel in 2 habitat combinations,1 previously known (sand bed texture, 0–2 m depth, <50 m from riverbanks) and 1 novel (non-sand bed texture, 0–4 m depth, 25–125 m from riverbanks). These predictions will be used to identify target areas for future surveys and restoration actions for Yellow Lampmussel. Second, we identified habitat features (bed texture, depth, vegetation, and large wood) relevant for spawning, foraging, and overwintering for an endangered migratory fish, *Acipenser brevirostrum* (Shortnose Sturgeon). These findings will be used to inform site selection for future environmental DNA and acoustic monitoring of Shortnose Sturgeon. The habitat maps (>220 river km) are not only valuable for the management of these threatened species, but could be applied to any other aquatic species in the Connecticut River. Our findings demonstrate that side-scan sonar and head-up digitization can be a cost-effective, efficient, and accurate way to characterize aquatic mesohabitat over large geographic areas for focusing conservation and management activities.

Sat-PM2-B-6

Learning Natural History and Ecology on the Landscape of Marist University

Richard S. Feldman (Marist University, Poughkeepsie, NY), Kate Weiss (Marist University, Poughkeepsie, NY), Ramesh Laungani (Marist University, Poughkeepsie, NY), and Zion Klos (Marist University, Poughkeepsie, NY)

Abstract - The 4 full-time faculty of the Deptartment of Environmental Science and Policy use the Marist campus extensively for teaching and student research. Five-ha (12-ac) Fern Tor Nature Preserve sits conveniently at the north end of campus, is mostly forested, with varied terrain and corresponding variations in soils, vegetation and geology. A creek and pond occupy its center, with associated floodplain and wetland, suitable for student hydrologic research and biological sampling. Fern Tor is an outdoor classroom for several of our courses, e.g., Introduction to Environmental Issues, Hudson Valley Natural History, Geology, Ecology, Braiding Our Relationships with the Natural World, Environmental Methods, Environmental Literature, Biodiversity and Conservation, and Earth Systems Science. Supervised student research there has included floral surveys, tick monitoring, jumping-worm monitoring, soil hydrology, and mammal monitoring. Students complete independent field journal entries there for some courses. Students engage in conservation and restoration efforts by controlling *Reynoutria japonica* (Japanese Knotweed), *Rubus phoenicolasius* (Wineberry), and *Akebia quinata* (Chocolate Vine), and by planting native trees and shrubs. These activities were especially important during Covid as a means of getting students outside for learning and enjoyment, releasing some of the stress accumulated during that period. We use main campus to illustrate tree species diversity, hone tree-identification skills, illustrate campus as an ecosystem with interacting parts and environmental impacts, monitor mammal activity with remote wildlife cameras, and conduct geological mapping.

Sat-PM2-F-4

Investigating Dogs' Behavioral Response to Wolf Scat as Compared to Scat from Prey Animals

Wheeler Fisher (Penn Vet Working Dog Center, Philadelphia, PA), Molly Buis (Penn Vet Working Dog Center, Philadelphia, PA), Emma Gaalaas-Mullaney (Penn Vet Working Dog Center, Philadelphia, PA), and Clara Wilson (Penn Vet Working Dog Center, Philadelphia, PA)

Abstract - Working dogs may encounter predator odors in operational environments, yet it is unclear whether domestic dogs with no prior exposure show intrinsic behavioral responses to such odors. We evaluated responses to *Canis lupus* (Wolf) scat compared with non-predator fecal stimuli in both field and controlled-laboratory settings. Twelve dogs of various breeds and ages attending a scent-detection workshop completed a field walk consisting of 4 sequential stations presenting *Ovis aries* (Sheep) feces, Wolf scat, *Cavia porcellus* (Guinea Pig) feces, and an odorless blank control. Our results indicate reduced close-range investigation of predator-derived odor and differing interaction durations between stimuli. A laboratory follow-up using a subset of the same dogs ($n = 6$) placed subjects in a room with their handler, an unfamiliar person, and a caged fecal sample. Dogs spent more time interacting with prey-derived odor than predator-derived odor and had increased attention to their handler during the Wolf presentation. These preliminary findings do not support the hypothesis that dogs display an innate investigative preoccupation with Wolf scat. Additional data collection with counterbalanced presentations is planned to distinguish first-exposure novelty effects from stimulus-specific responses to the Sheep feces.

Sun-PM2-E-5

Locating Haitian Coleoptera Specimens in University of Vermont's Zadock Thompson Zoological Collection

Finn Flynn (University of Vermont, Burlington VT)

Abstract - Haiti is the second most biodiverse region in the Caribbean, with its wide diversity in habitats playing host to an incredible variety of flora and fauna, much of which is endemic. However, due to high rates of deforestation, Haiti is undergoing a mass extinction of biodiversity. The study of Haiti's historical biodiversity is therefore of great importance to conservation efforts. Full understanding of this fragile ecosystem is impeded by a lack of available data, due to historical turmoil in the region. The few existing Haitian zoological collections provide key insight into the historical biodiversity of Haiti, allowing researchers to compare current and historical data to identify threatened species. UVM's Zadock Thompson Zoological Collection was recently discovered to contain ~300 Haitian Coleoptera from the 1970s and 1980s, making it the third largest of its kind globally. Dr. Michael Ivie, a specialist in Caribbean Island beetle systematics, has requested the study of these specimens. My project was to locate the existing Haitian beetles within our Coleoptera collection, and accession them to prepare them for Dr. Ivie's use. This dataset will contribute to the further understanding of Coleoptera biodiversity in Haiti, and the wider Caribbean Islands.

Sat-PM2-C-2

The Edna Lawrence Nature Lab: A Uniquely Inspiring Resource for Art & Design

Benedict L. Gagliardi III (RISD, Providence, RI)

Abstract - In 1937, Rhode Island School of Design (RISD) faculty member Edna Lawrence founded The Nature Lab to "open students' eyes to the marvels of beauty in nature...of forms, space, color, texture, design, and structure." Ninety years later, the Lab still offers unmediated access to authentic natural history specimens, while also fostering creative inquiry into biodesign, ecology, and the climate crisis. High-end microscopes, high-speed cameras, and other advanced imaging systems give members of the RISD community access to living and non-living specimens at multiple scales and provide an engaging platform for examining myriad connections between artistic and scientific study. The Nature Lab is a one-of-a-kind resource that furthers RISD's hands-on approach to learning by enabling students to investigate ethical, sustainable modes of making informed by natural systems and designed to benefit the environment. Ultimately, it helps everyone who makes use of our resources better understand and articulate the role we play as humans in the ecosystem.

Sun-PM2-F-6

Biodiversity Gains in ROW: Importance of Information-Based Programs

Mariclaire Rigby (National Grid, Boston MA) and **Eric George** (National Grid, Boston MA)

Sat-AM1-F-1

Vermont's Native and Invasive Freshwater Mollusks and Crustaceans

Melanie Giangreco (Upstream Consulting & Evaluation, LLC, Richmond, VT), Paul Evans (University of Florida Invasion Science Institute, Gainesville, FL), Lindsey Reisinger (University of Florida, Gainesville, FL), and Anila Kalonia (Upstream Consulting & Evaluation, LLC, Richmond, VT)

Abstract - Project CLAM (Champlain Aquatics Monitoring) is a 3-year research study to better understand the distribution of invasive mollusks and crustaceans including, but not limited to: *Corbicula fluminea* (Golden Clam), *Faxonius rusticus* (Rusty Crayfish), *Bythotrephes longimanus* (Spiny Waterflea), *Callinina georgiana* (Banded Mystery Snail), and *Dreissena polymorpha* (Zebra Mussel) throughout the Vermont and New York portions of the Lake Champlain Basin, and habitat characteristics that may contribute to invasion. In the first year of the project (2025), we sampled Vermont rivers, ponds, and access points to Lake Champlain where we documented new invasions as well as a wide variety of native species, including some that are classified as species of greatest conservation need (SGCN). We will present key preliminary findings, provide an opportunity for attendees to see preserved specimens and photographs to increase their understanding of the mollusk and crustacean species present in the region (particularly understudied native freshwater snails), and share ways that anyone can contribute to data collection efforts through existing reporting programs in Vermont and New York.

Sat-PM2-B-3

Effective Conservation Education for Diverse Audiences: Storytelling and Filmmaking

Alan R. Giese (Vermont State University – Lyndon, Lyndonville, VT) and Melanie Finn (BirdStory,, Kirby, VT)

Abstract - Classic approaches to science education can bore, baffle, and alienate nonscientists. Fact-laden lectures can produce an overburden of information and a vacuum of understanding. Additionally, socially, economically, or politically charged topics can produce knee-jerk resistance. We leverage storytelling and filmmaking to overcome those obstacles. In a film and associated lesson plans about the endangered *Ammospiza caudacuta* (Saltmarsh Sparrow), we use the filmmakers' story, pop-media depictions of swamp monsters, and historical saltmarsh economics as vehicles that transport the audience to a lesson about climate change, sea-level rise, and threatened ecosystems.

Sat-PM2-A-2

A Community-Driven Framework for Interoperable Biodiversity Data Networks

Edward Gilbert (University of Kansas, Lawrence, KS), Mark Fisher (University of Kansas, Lawrence, KS), Samanta Orellana (University of Kansas, Lawrence, KS), Katie Pearson (University of Kansas, Lawrence, KS), Lindsey Walker (University of Kansas, Lawrence, KS), Jenn Yost (University of Kansas, Lawrence, KS), and Nico Franz (University of Kansas, Lawrence, KS)

Abstract - Biodiversity data are inherently decentralized in that they are generated, curated, and maintained across thousands of local museums, herbaria, and research collections, yet their greatest scientific value emerges only when they are discoverable and interoperable at global scales. Reconciling local stewardship with global integration presents persistent technical and social challenges, including data fragmentation, limited interoperability, and weak bidirectional feedback ("round-tripping") between source collections and external researchers. The development and growth of Symbiota (https://symbiota.org) represents a community-driven response to this persistent tension. Originally developed as a regional data publication platform, Symbiota evolved into a full-featured, open-source content management system supporting end-to-end specimen workflows, including digitization, georeferencing, imaging, annotation, taxonomic management, and standards-compliant data publishing. Its architecture was profoundly shaped by successive investments from the National Science Foundation, particularly the Advancing Digitization of Biodiversity Collections (ADBC), which catalyzed large-scale digitization initiatives and emphasized standardization, data quality, and sustainable cyberinfrastructure for natural history collections. Building on this foundation, Symbiota advances a decentralized aggregation model in which portals function simultaneously as data managers and publishers, and as both sources and sinks for new annotations, thereby enabling institutions to retain authoritative control while contributing to broader knowledge networks. Recent developments include a fully documented API-driven architecture that supports real-time, bidirectional data exchange among distributed portals. This infrastructure enables transparent record-level annotation tracking, dynamic synchronization of updates, and improved data provenance across networks. Symbiota demonstrates how decentralized, community-governed systems can overcome longstanding barriers to data sharing, strengthen trust and provenance, and support more reproducible science in an increasingly data-driven world.

Sat-AM1-C-2

Birds and Bogs: Climate Change and Life at the Edge of the Boreal

Michale Glennon (Paul Smith's College Adirondack Watershed Institute, Paul Smiths NY)

Abstract - New York State's Adirondack Park is a large, intact breeding ground for numerous migratory bird species, several of which are declining throughout their range. A unique component of the Adirondack avifauna is the birds inhabiting the boreal peatlands of the park. Climate change is now widely recognized as the pre-eminent threat to biodiversity in the 21st Century. At the southern range extent for this ecosystem type and many of its avian inhabitants, the park is a valuable location from which to monitor changes in bird populations from a warming climate. Findings from long-term monitoring of boreal birds in the Adirondacks suggest that bird responses to climate change may be mediated by land-use patterns, highlight the importance of a patchy habitat distribution, and raise important implications for potential conservation strategies in these habitats.

Sun-AM2-C-2

Restoration of American Elm to the Northeast

Gus Goodwin (The Nature Conservancy, VT), Kathleen Knight (United States Forest Service, Delaware OH), Cornelia Wilson (United States Forest Service, Delaware OH), Charlie Flower (Ecological Engineering International, LLC), and Christian Marks (Formerly The Nature Conservancy, Northampton, MA)

Abstract - Before the arrival of Dutch elm disease, *Ulmus americana* (American Elm) was a widespread and ecologically important component of floodplain forests in the Northeast. Although it remains common, the prevalence of Dutch elm disease prevents American Elm from reaching its full ecological potential as a large, long-lived tree that characterizes mature floodplain forests. For more than a decade, the US Forest Service and The Nature Conservancy have been working in partnership to identify surviving American Elms across New England to test for tolerance to Dutch elm disease and establish a population of disease-tolerant trees that can be used to restore the species across the region. This year brings an exciting milestone, where thousands of experimental trees in Vermont will be tested for tolerance to Dutch elm disease. Initial observations, from similar trees grown in Ohio, indicate several individuals with heightened disease tolerance that can be included in restoration seed orchards. These orchards, composed of the best surviving trees from the experiment, will provide seed to support the reestablishment of American Elm in floodplain forests, city streets, and backyards across New England.

Sun-AM1-D-2

Absolutely Dated Associations of Human Beings and Extinct or Extirpated Mega-Fauna in Northeastern North America: 2014–2026

Richard Michael Gramly (North Andover, MA)

Abstract - Archaeological excavations and inspection of museum collections since 2014 in New York, Ohio, Kentucky, and Tennessee have expanded insights to human interactions with extinct and extirpated Late Pleistocene fauna. Here are presented fresh absolute dating evidence for interactions as well as the nature of these relationships. Further, the prospects for augmenting our knowledge via continuing scientific endeavors are discussed.

Sat-PM1-F-3

Examining Eastern Red-backed Salamander Movement Patterns Across Artificial Habitat Arrays

Anna Green (Cornell University, Ithaca, NY), Caroline A. Goldstein (Cornell University, Ithaca, NY), Tiffany Suiters (Cornell University, Ithaca, NY), Stephen Bredin (Cornell University, Ithaca, NY), Lauren R.A. Essner (Cornell University, Ithaca, NY), William Hooker (Cornell University, Ithaca, NY), Andrew Orkney (Cornell University, Ithaca, NY), Priscila Rothier (Cornell University, Ithaca, NY), Kay Williams (Cornell University, Ithaca, NY), William Ryerson (Cornell University, Ithaca, NY), and Brandon P. Hedrick (Cornell University, Ithaca, NY)

Abstract - Understanding animal-movement patterns is crucial for predicting species responses to habitat fragmentation and climate change. *Plethodon cinereus* (Eastern Red-backed Salamander) is an abundant forest floor predator commonly used as a model system for assessing salamander population dynamics. Much work has been done attempting to understand how climate affects their ranges at regional scales. However, their fine-scale movement ecology remains poorly understood. We investigate salamander micro-dispersal, any movements under 30 m, using coverboard arrays and spatial capture-recapture methods to address 3 key questions. (1) We evaluate whether coverboard-array organization creates high-quality habitat and impacts perceived forest population density. We established 9 coverboard arrays (50 boards each) across Ithaca, NY, with 12 additional outer boards positioned 3 m from each array's perimeter. We predicted that salamanders would move from outer boards to inner boards, inflating density within the array. Preliminary data suggest limited movement between outer boards and inner arrays, contradicting our sink hypothesis. (2) We then calculated density and maximum mean distance moved, predicting high-density areas will increase maximum movement distances as individuals compete for resources. (3) Finally, using translocation experiments, we marked salamanders and then moved them 18-30 m to test site fidelity and distance-dependent homing success. We predicted higher homing success at shorter distances (18 m vs 30 m) and longer homing times at greater distances, demonstrating site fidelity and overland movement capacity in this species. These findings aim to assess the Eastern Red-backed Salamander's capacity to colonize new habitats, as climate change shifts the more suitable habitat northward.

Sun-AM2-D-4

Why Taxonomy and Systematics Matter with Conservation Research: Case Studies on Three Stonefly Species of *Leuctra*

Scott A. Grubbs (Western Kentucky University, Bowling Green, KY), R. Edward DeWalt (University of Illinois, Champaign-Urbana, IL), Phillip N. Hogan (University of Illinois, Champaign-Urbana, IL), and Luke W. Myers (SUNY Plattsburgh, Plattsburgh, NY)

Abstract - Describing and understanding species should not be viewed as arcane endeavors nor esoteric in practice, but rather important for biodiversity inventories (e.g., ATBIs and BioBlitzes), enacting conservation practices, predicting diversity patterns, preparation of scientifically credible policy and law, and proper management of natural resources. The capacity to initiate conservation practices or provide protection for rare species is predicated on sound taxonomy and systematics. Defining or redefining a species, regardless of which species concept is applied, including taking an integrative morphological-molecular approach to correct misidentifications or update out-of-date taxonomy, occasionally needs to be the first step in the conservation or protection process. In addition, care has to be taken to correct misinformation, including inaccurate or incomplete distributional information. We present case studies on 3 species of North American *Leuctra* (Plecoptera: Leuctridae): *L. laura* (Hampshire Needlefly), *L. szczytkoi* (Louisiana Needlefly), and *L. monticola* (Mountain Needlefly). Although the circumstances regarding taxonomic and distributional information of each stonefly species are unique, resolving and updating both are necessary to move forward with potential conservation practices.

Sun-AM1-F-1

A Rarity Assessment of New Jersey's Lichens

Jason Hafstad (NJ Natural Lands Trust, Trenton, New Jersey)

Abstract - A major limiting factor in biodiversity conservation is the large number of data-deficient taxa groups for which there have been no rarity assessment. Presented here is the first attempt to assign rarity ranks to all lichen species documented from New Jersey. The checklist of New Jersey lichens, published by Dennis Waters and James Lendemer in 2019, serves as a foundational resource for this assessment. However, a significant challenge lies in the data-deficiency of many lichen species, making traditional rarity assessments difficult. To address this, we employed various strategies to estimate rarity ranks, including habitat preference, geographical distribution, ease of identification, and life-history traits.

Sat-AM1-E-2

The Potential Roles that Volatile Compounds of Bacteria Play in the Chemical Communication of *Plethodon cinereus*

Shelby Hager (Michigan State University, East Lansing, Michigan) and Louise Mead (Michigan State University, East Lansing, Michigan)

Abstract - Historically, research on sexual communication in many taxa has disproportionately focused on males, overlooking female signaling mechanisms. In the genus *Plethodon*, chemical communication research has largely centered on male courtship pheromones—PMF, PRF, and SPF—while female chemical signaling remains understudied. This bias highlights a critical gap: whether females employ alternative mechanisms of chemical communication. We hypothesize that bacterial symbionts contribute to female chemical signaling through the production of volatile compounds. Microbe-mediated communication has been demonstrated in mammals (e.g., hyenas) and birds (e.g., *Junco hyemalis* [Dark-Eyed Junco]), yet comparable mechanisms have not been investigated in amphibians. While amphibian microbiomes have received increasing attention, their potential role in chemical communication remains largely unexamined. In this mechanism, hosts utilize volatile compounds produced by skin-associated bacteria to signal traits such as individual identity, group membership, or social status. To test this hypothesis, we sampled adult *Plethodon cinereus* (Eastern Red-backed Salamander) of both sexes across multiple geographically distinct localities using standardized skin swabbing. We will characterize bacterial community composition using 16S rDNA gene sequencing and analyze volatile chemical profiles using solid phase microextraction (SPME) analysis. We predict that bacterial community composition and volatile profiles will differ by sex and potentially by locality and individual identity, consistent with a role of chemical signaling. Demonstrating microbe-mediated signaling in *Plethodon* could identify a previously unrecognized communication pathway in amphibians and directly address long-standing sex biases in studies of vertebrate chemical communication.

Sat-AM2-D-1

The Short-Lived Champlain Sea

Stephen S. Hale (Retired, US Environmental Protection Agency, Charlotte, VT)

Abstract - In 1849, while watching workers digging a cut for a railroad in Charlotte, VT, John Thorpe noticed strange bones jutting from a pile of clay soil. From them, State Naturalist Zachary Thompson pieced together a full skeleton of *Delphinapterus leucas* (Beluga Whale). This discovery helped uncover a story of a massive ice sheet and the Champlain Sea. That sea formed ~12,000 years ago as the Laurentide Ice Sheet retreated. The St. Lawrence basin, depressed by the weight of an ice sheet >2 km thick, had sunk below sea level. When blocking ice melted, the rising Atlantic Ocean surged in. The sea covered 55,000 km^2 of present-day Vermont, New York, Quebec, and Ontario. In the north, towering ice cliffs calved icebergs into silty, gray waters laden with glacial rock flour. Wetlands and tundra covered the southern edge. Herds of *Odobenus rosmarus* (Walrus) lived on the ice edge, *Erignathus barbatus (*Bearded Seals) rested on pack ice, and Beluga whales swam in open water. Over time, water temperature rose, and meltwater from the retreating ice sheet and alpine glaciers lowered salinity. As isostatic rebound raised the land surface, the sea shrank and shallowed. By ~10,000 years ago, the rising land had severed the ocean connection, and the Champlain Sea came to an end, replaced in its southern arm by Lake Champlain.

Sat-AM2-B-5

Genetics of Green Alder in Disjunct Populations from Pennsylvania and the Southern Appalachians

Anaya Harry (University of North Carolina Asheville, Asheville, NC), **Rachel Goad** (Western Pennsylvania Conservancy, Harrisburg, PA), Jennifer Ward (University of North Carolina Asheville, Asheville, NC), Irene Rossell (University of North Carolina Asheville, Asheville, NC), Matt Estep (Appalachian State University, Boone, NC), and Stephanie Seymour (Pennsylvania Department of Conservation and Natural Resources, Harrisburg, PA)

Abstract - *Alnus crispa* (Green Alder) is a circumboreal shrub that is widely distributed in Canada and the north-central and northeastern US, with disjunct populations in Pennsylvania and the southern Appalachian mountains. Green Alder reproduces both sexually and vegetatively, with significant clonal reproduction. The single known extant Pennsylvania population (classified as state-endangered) occurs along the rim of a steep river gorge on DCNR-owned land in Tioga County, PA. Another occurrence in Bedford County, PA, has not been observed in >40 years and is now thought to be extirpated. The southern Appalachian population (classified as a species of special concern) occurs in high-elevation grassy balds at Roan Highlands along the NC/TN border. The genetic relationship within, as well as between, plants in the northern and southern populations is unknown. We collected 1 leaf from each of 7 alder clumps at Leonard Harrison State Park and 43 clumps at Roan Highlands to be analyzed for genetic patterns. We extracted DNA from frozen leaves using a modified CTAB method, and checked DNA quality and quantity with nanodrop spectrophotometry. We will analyze genetic variability using 10 published microsatellite (SSR) loci. Results will tell us how closely related plants from the 2 populations are, how variable each population is, and whether stems within clumps constitute one or several genets. These findings could inform future conservation or translocation plans.

Sat-AM1-F-3

A Model for Creating Inclusive and Enriching Undergraduate Experiences in Herbarium Digitization

Kristen R. Haynes (SUNY Oswego, Oswego, NY) and Kamal I. Mohamed (SUNY Oswego, Oswego, NY)

Abstract - When we began a mass digitization project of the SUNY Oswego Herbarium, one of our goals was to create meaningful, inclusive, and learning-infused undergraduate experiences that would help students build skills for careers in the museum field. Our challenge was that the repetitive tasks involved in digitization—imaging, filing, and transcribing—are not inherently engaging or enriching for most students, especially if their work is confined to one task. Furthermore, at universities like ours that emphasize other subdisciplines of Biology, finding students intrinsically excited about plants can also be challenging. However, we found that student experiences, if thoughtfully structured, can be highly impactful—perhaps all the more so if students have limited prior plant experience. Working with our Office of Experiential Learning and building from training we received in mentoring and inclusion, we designed a paid and for-credit internship experience that proved transformative for many of the 25 students who participated over 3 years. In this talk, we share the elements of our internship, as well as student feedback and outcomes, to serve as a model for engaging undergraduates in digitization work.

Sat-AM2-C-4

35,000 Images Later: Our Experience Mass-digitizing the SUNY Oswego Herbarium

Kristen R. Haynes (SUNY Oswego, Oswego, NY) and Kamal I. Mohamed (SUNY Oswego, Oswego, NY)

Abstract - In 2022, the team at the SUNY Oswego Herbarium (OSW) began a 3-year mass curation and digitization effort of the collection's 35,000 specimens. OSW, which includes part of the orphaned Syracuse University (SYR) collection, spans 200+ years, 40+ counties, all 50 states, and all counties of New York State. However, until recently, these data were undiscoverable by researchers, being uncatalogued and undigitized. This talk shares the story of our digitization journey, including the history and significance of the collection, the methods we used, the project's impacts (particularly for New York State flora), and the lessons we learned along the way. As we discovered, small collections can reap large rewards by securing and sharing their data through digitization. Our hope is that our story will inspire other collections to digitize and lower the learning curve for those planning digitization projects.

Sun-PM2-C-4

"Containing Not a Few Specimens of Great Value": 200 Years of Natural History Collections at the University of Vermont

Sara Helms Cahan (Zadock Thompson Zoological Collections, UVM, Burlington, VT)

Abstract - Natural history collections are the repositories of irreplaceable specimens that document biodiversity across time and space, from our backyards to the far corners of the globe. As tangible, physical objects, the material housed in these collections allow us to directly revisit the past as new questions arise and new technologies expand what we can learn from the past. Natural history has a long and distinguished history in the state of Vermont, both as an intellectual pursuit and as a physical cabinet, housed at the University of Vermont, of the "Organick remains of this town." In this talk, I will trace the history of the College of Natural History from 1826 to the present, and highlight the ways in which biological collections such as ours continue to demonstrate their value for advancing knowledge, supporting high-impact education, and sharing the beauty and science of the natural world.

Sat-PM2-C-1

Range Contraction of Northeastern Spruce-Fir Birds Revealed by 15 Years of Monitoring

Jason M. Hill (Vermont Center for Ecostudies, White River Junction, VT)

Abstract - High-elevation spruce–fir forests of the northeastern US support a distinctive bird community that is sensitive to climate and land-use change, yet range-wide trends remain poorly resolved. Using 2010–2025 data from the Mountain Birdwatch program, I modeled changes in occupancy dynamics for *Catharus bicknelli* (Bicknell's Thrush), *Setophaga fusca* (Blackpoll Warbler), and *Zonotrichia albicollis* (White-throated Sparrow) across nearly 800 monitoring stations spanning New York, Vermont, New Hampshire, and Maine. I fit dynamic occupancy models that estimate colonization and extinction while accounting for imperfect detection and variation in survey conditions. Across species, colonization probabilities declined strongly through time, indicating that birds are rarely appearing at previously unoccupied sites. Extinction probabilities showed weaker but consistent increases, with the highest losses occurring at lower elevations and lower latitudes. As a result, the expected number of occupied monitoring stations declined substantially over the study period, and newly occupied sites were concentrated at higher latitudes and elevations. Patterns were remarkably consistent across all 3 species, suggesting a coordinated contraction of the northeastern spruce–fir bird community rather than species-specific responses. These results align with recent field observations at the southern and lower-elevation margins of the region and highlight the importance of long-term monitoring for detecting broad-scale distributional change. I will present maps of site persistence, loss, and recent colonization together with modeled colonization and extinction trends. These patterns point to an ongoing contraction of the northeastern spruce–fir bird community and provide a foundation for future work examining the drivers of change in montane ecosystems.

Sun-AM2-E-

Transmitters, Toads, and Turtles: Finding various targets with a Conservation Dog

Kristine Hoffmann (Bark and Code LLC, Potsdam, NY)

Abstract - The performance of detection dogs depends partially on air flow, surface area, and the bond with their handler. Here I report on typical detection distances and alerts for several targets for the purposes of planning future surveys. I include 1 conservation detection dog with extensive experience (K9 Newt, a Labrador retriever) and 2 junior dogs in training (K9 April Showers, a Labrador retriever, and K9 Echo, a shepherd-husky mix). In habitat with minimal cover, K9 Newt and K9 April Showers detected GPS collars dropped from *Martes pennant* (Fisher) at a distance varying by model (2 m for a 17.5 cm collar and 5 m for a 27.8 cm collar during training). K9 Newt was able to detect *Scaphiopus holbrookii* (Eastern Spadefoot Toad) burrows from about 15 cm, and above-ground adults from ~80 cm. K9 Newt smelled *Glyptemys insculpta* (Wood Turtle) adults from ~10 m and juveniles from ~3 m. All 3 dogs were trained on *Terrapene carolina* (Eastern Box Turtle) and *Gopherus polyphemus* (Gopher Tortoise) at burrows, and detected their odor from 10 m. Two of the dogs' alerts to tortoises differed from their alert to Eastern Box Turtles, with K9 Newt freezing and K9 April standing and looking back instead of laying down. I suggest that canine surveys for frogs and dropped collars use small grid cells while surveys for turtles use 10-m-wide transects.

Sun-PM2-E-1

Evidence for Large-Scale Epiphyte Declines in the Northeast Necessitate Incorporation into Invasive Species Management and Monitoring

Jeremy W. Howland (Department of Biology, The Graduate Center, The City University of New York, NY; Department of Botany, Research and Collections, New York State Museum, Albany NY) and James C. Lendemer (Department of Biology, The Graduate Center, The City University of New York, NY; Department of Botany, Research and Collections, New York State Museum, Albany NY)

Abstract - Epiphytes like mosses and lichens are intrinsically tied to the stability of their local forest landscape and climate. Despite being ecologically important and abundant, they are rarely incorporated into conservation and management practices. Many are intolerant to rapid changes related to forest composition (e.g., loss of specific host-tree species, altered stand structure, pronounced edge effects, and shifts in humidity regimes). These species are often microhabitat specialists associated with mature canopy trees and old growth. Rapid late 19th-century industrialization and large-scale agricultural expansion across the Northeast resulted in loss and fragmentation of mature forests. Sparse data for pre-industrial epiphyte distributions make it difficult to reconstruct the original baselines for these species and the communities they form. However, it is clear that late 19th century changes to northeastern forests resulted in widespread epiphyte declines that left many restricted to remnant forest refugia. Over the subsequent century, epiphytes further declined due to increased fragmentation, local extinction, and air pollution. Now the surviving remnants of historical populations are increasingly at risk due to indirect impacts from invasive species. This presentation will explore the ongoing and evolving impacts of invasive species on forest epiphytes in the Northeast with the goal of developing more wholistic monitoring and conservation protocols.

Sat-AM1-E-3

Hidden Herbalists-Insight into the Women Behind Brown's Collection

Izzy Hudson (Brown University, Providence, RI), Rebecca Kartzinel (Brown University, Providence, RI), and Mary Dennis (Brown University, Providence, RI)

Abstract - Historically, women have contributed greatly to herbarium collections but were often poorly documented in the field up until recent years. We assessed how many women collectors have made reported contributions to the Brown Herbarium over the course of its history, as well as how many total specimens we can attribute to their efforts. Alongside the information collected from our databased specimens, we recently acquired the Wheaton College collection, which contains many specimens curated by women collectors from the 1900s. Many of the individuals from both the Brown Herbarium and newly acquired Wheaton collection have untold stories, and we dive into a few of their backgrounds to recognize them as both botanists and early pioneers in specimen curation.

Sat-AM2-C-5

Wintering Strategies and Migratory Connectivity of Eastern Grassland Savannah Sparrow Populations

Claire Huff (University of New England, Biddeford, ME), Noah Perlut (University of New England, Biddeford, ME), Steven Travis (University of New England, Biddeford, ME), and Will Kochtitzky (University of New England, Biddeford, ME)

Abstract - Grassland birds are the fastest declining group of birds in North America, yet many aspects of their nonbreeding ecology remain poorly understood. We used light-level geolocators to examine migratory connectivity and winter thermal environments of 2 *Passerculus sandwichensis* (Savannah Sparrow) populations that breed 300 km apart in agricultural grasslands in Vermont and New York between 2018 and 2025. Using individual winter locations derived from geolocator data, we quantified the extent of migratory connectivity between these populations, a foundational pattern that has not yet been described for this species. We found weak migratory connectivity between breeding populations (Mantel $r = -0.12$), with individual wintering locations from these populations spanning a broad geographic range of 28 degrees of latitude and 20 degrees of longitude across the eastern US, Caribbean, and parts of Central America. In addition, we linked individual winter locations to winter thermal environments by extracting measures of thermal variation experienced by each bird during the nonbreeding season. These data allowed us to evaluate how winter geographic position corresponded to differences in thermal variation, a potential driver of migration timing in birds. We present results from both the migratory connectivity and winter thermal analyses and discuss how variation in winter environments may shape migration strategies, timing trade-offs, and vulnerability of grassland birds in a changing climate.

Sun-AM2-A-1

Managed Powerline Rights-of-Way as Habitat for Rare Bees in the Northeast

Molly M. Jacobson (SUNY ESF, Syracuse, NY), Paige Chesshire (SUNY ESF, Syracuse, NY), Michael Schummer (SUNY ESF, Syracuse, NY), Donald Leopold (SUNY ESF, Syracuse, NY), Chris Controneo (Consolidated Edison, Inc., New York, NY), and Chris Peterson (Consolidated Edison, Inc., New York, NY)

Abstract - Powerline rights-of-way (ROWs) are vital sources of early successional habitat, particularly shrubland, on the northeastern landscape. Continually managed to prevent reforestation through mechanical control of tall woody plants, these sites can be critical for many at-risk wildlife dependent on ever-shrinking open habitats and offer dispersal corridors through fragmented habitat matrices. However, their value to native bees is less widely understood, and just as important for future management considerations. Here, we provide an overview of preliminary results from a 3-year study of ROWs and associated facilities in the lower Hudson Valley of New York, conducted from 2023 to 2025 and spanning 71 sites across both sides of the Hudson River. Among the ≥160 bee species recorded, we documented some of the region's rarest bees, from *Epeoloides pilosulus* (Macropis Cuckoo Bee) and *Panurginus potentillae* (Cinquefoil Miner Bee) to the first state record of the adventive *Lithurgus chrysurus* (Golden-tailed Woodborer). The vast majority of the native rarities are specialized to rely directly or indirectly on plants that flourish in ROWs because of the unique conditions in these corridors, due in large part to ongoing management or restoration efforts. We will discuss plant–pollinator associations of conservation relevance, habitat characteristics of sites undergoing different forms of management, and recommendations for preserving and enhancing these important components of the landscape with pollinators in mind.

Sun-AM2-B-3

Integrating Citizen Science and Specimen Collection in a Multi-year Campus Bee Survey

Molly M. Jacobson (SUNY ESF, Syracuse, NY)

Abstract - As an affiliate of the Bee Campus USA program (Xerces Society for Invertebrate Conservation), the SUNY College of Environmental Science and Forestry (ESF) has created and enhanced nearly 2323 m^2 (25,000 ft^2) of native pollinator habitat on its main Syracuse campus in the last 4 years. To determine if these changes in landscaping practices are tangibly benefitting local pollinator communities and provide recommendations for future plantings, as well as contribute to our understanding of wild bee ecology and species distributions in the Northeast, we conducted a multi-year inventory of bee species on our small urban campus. We sought to involve students heavily in data collection and processing, by utilizing iNaturalist to collect observational data, hosting educational workshops for student volunteers, and training undergraduate technicians to capture bees through sweep-netting and to pin, database, and curate resulting collections. The inventory revealed 104 bee species, including regionally rare, specialized, and at-risk species, and recorded hundreds of plant–pollinator interactions that revealed valuable patterns in resource use indicating the importance of intentional native landscaping for wild bees. The combination of empirical techniques and citizen science allowed us to compare the usefulness of these survey methods in documenting bee species and engaging students, with each producing different data that together increased the impact of the project. We encourage other campuses to conduct pollinator surveys, and offer insights from our experiences conducting this multi-year inventory.

Sat-PM2-F-5

Preliminary Analysis of the Spatial Distribution and Species Richness Patterns of Vermont Stoneflies (Insecta, Plecoptera)

Maria C. Jankowski (SUNY Plattsburgh, Plattsburgh, NY), Luke Myers (SUNY Plattsburgh, Plattsburgh, NY), Scott Grubbs (Western Kentucky University, Bowling Green, KY), Chris Verdone (North Carolina Department of Environmental Quality, Raleigh, NC), Lindsey Pett (Norwich University, Northfield, VT), Ed DeWalt (Illinois Natural History Survey, Champaign, IL) and Tim Mihuc (SUNY Plattsburgh, Plattsburgh, NY)

Abstract - Stoneflies (Order Plecoptera) are one of the most sensitive orders of aquatic insects, often used as indicators of environmental conditions. They are also essential components of both aquatic and terrestrial food webs. Understanding fundamental information on distributional patterns and habitat preferences of individual species is important to guide future conservation efforts and decisions, especially for species of greatest conservation need (SGCN). The Northeast USA Status Assessment of Stoneflies (Insecta: Plecoptera) Regional Species in Greatest Conservation Need (RCN 3.0) examines the distribution of 33 stoneflies of conservation concern. This project is addressing the stonefly fauna of Vermont, as records from this state were sparse prior to 2024 and scattered across individual species descriptions, revisions, newsletters, and other sources. This project also creates the first dataset of Plecoptera from Vermont in Darwin Core Archive format for long term use. We have recorded 92 species to date from Vermont, including 48 previously unreported. We will examine and present preliminary results of the spatial distribution of Plectopera in Vermont in regards to US EPA Level IV ecoregions, elevation patterns, and USGS HUC8 watersheds using data from our contemporary field collected specimens, valid literature sources, and institutional collections. We will also discuss key state records, trends in distribution and present an updated list of Plecoptera for the state of Vermont.

Sun-AM1-F-2

The Plants of North Pownal

Jerry Jenkins (Northern Forest Atlas Project, White Creek, NY)

Abstract - Quarry Hill, in North Pownal, VT, is a dry-rich botanical hotspot, with at least 66 vascular plants and 29 species of mosses that are associated with high-pH, calcium-rich soils. The site has been visited by botanists from 1897 to the present. The flora is well known, though apparently changing. The ecology is less well known. The conventional explanation, that it is a limestone hill and therefore has a lot of rare species, is neither true nor sufficient. Here I describe, from my own observations, the chemical, physiographic, and biogeographic factors that influence the diversities of calcareous hills; and the way that, over 130 years, the character of the community may have changed, becoming more mesic, while the setting and physical drivers have remained constant.

Sat-PM1-C-4

Making a Landscape-based Field Manual

Jerry Jenkins (Northern Forest Atlas Project, White Creek, NY)

Abstract - Good botanists know, almost immediately, what plants they are seeing. They learn this from field manuals, which arrange plants into groups based on characters. This, botanists say, is a brown hummock-forming sphagnum*,* likely *flavicomans,* and this is what I need to see to confirm it. Good botanists also know what they may see next. They do this by reading landscapes. This, they say, is an acid, groundwater-influenced basin bog on an Atlantic headland; *Sphagnum pulchrum* and *Gaylussacia bigeloviana* are very likely here. Currently, the only way to learn this is in the field; while there are many character-based field manuals, there are no landscape-based ones. I have told the Atlas Foundation that I will make the first one. It will be a guide to the identification of about 50 northern-forest landscapes and ~1500 plants from these landscapes. Doing this will be fascinating and difficult; it may well be my last book. I will talk about why I think it is important, the problems I expect to encounter, and what the solutions to those problems may look like.

Sun-PM2-D-5

Investigating Genomic and Microbial Diversity in Northeast US Alpine Ecosystems Under a Changing Climate

Grace H. Jia (University of Vermont, Burlington, VT), Sophia Brusch (University of Vermont, Burlington, VT), Christa S. Lessing (University of Vermont, Burlington, VT), and Stephen R. Keller (University of Vermont, Burlington, VT)

Abstract - Alpine zones in the northeastern US occur at high elevation on spatially isolated mountain tops and are home to regionally rare and vulnerable species. Since glacial retreat ~13,000 years ago, communities of alpine plants shifted as previously connected tundra landscapes retreated into today's fragmented "sky islands". Despite their isolation, these communities have endured millennia of environmental change, and we have yet to understand the underlying adaptive mechanisms responsible for their persistence. Information on the genomic and microbial diversity within species scattered across a range of isolated peaks may hold the key to insights into the changingconnectivity and demographic history of these populations. This may in turn increase our understanding of their resilience or susceptibility to a changing climate—a topic of considerable conservation and management concern. To date, there are few genomic resources for studying biodiversity in northeastern alpine zones. We aim to fill that gap through the development and sharing of such resources, including: (1) the generation of new reference genomes for 2 species, *Minuartia groenlandica* (Mountain Sandplant) and *Sibbaldiopsis tridentata* (Three-toothed Cinquefoil) using long-read Oxford Nanopore sequencing; (2) the creation of population-level genomic data for studying demographic history and local adaptation in 6 focal taxa which will also be planted in common garden experiments; and (3) microbiome sequencing of leaf endosymbionts sampled from natural plant communities along microenvironmental gradients. We report on current progress towards these goals, outline future sampling and sequencing plans, and present preliminary results on phyllosphere communities across Vermont's alpine peaks.

Sun-AM2-E-

Planting for Native Bees in Farm Bill Conservation Plantings in Southern New England

Casey L. Johnson (University of Rhode Island, Kingston, RI), Tracy A. Zarrillo (Connecticut Agricultural Experiment Station, New Haven, CT), Emma Tondre (University of Rhode Island, Kingston, RI), Kelsey Fisher (Connecticut Agricultural Experiment Station, New Haven, CT), and Steven Alm (University of Rhode Island, Kingston, RI)

Abstract - To address the documented declines in native bees and other beneficial pollinators, the US Congress passed the Food, Conservation, and Energy Act of 2008, otherwise known as the Farm Bill, which included provisions that authorized incentive-based conservation programs to be carried out on working lands through the Natural Resources Conservation Service (NRCS) to encourage the development of habitat for native and managed pollinators on farms. Our project sought to evaluate the outcome of 23 Farm Bill conservation plantings that were established in Connecticut and Rhode Island through this program. We conducted monthly surveys of each planting during the growing season (May–September) from 2023 to 2025 to document wild bee diversity and plant–pollinator interactions, as well as flower diversity and frequency, within each planted meadow. Here we quantify the key plant species that support wild native bees, especially rare species, and provide information for developing seed mixes that best meet the needs of bees in southern New England.

Sun-PM2-B-5

Ecology and Natural History of Vermont's Newest Butterfly Species: The Midsummer Tiger Swallowtail

Amber Jones (Vermont Center for Ecostudies, White River Junction, VT) and Kent McFarland (Vermont Center for Ecostudies, White River Junction, VT)

Abstract - In northeastern North America, *Papilio canadensis* (Canadian Tiger Swallowtail) and *P. glaucus* (Eastern Tiger Swallowtail) have long been recognized, with a third entity being treated as a hybrid of the 2 species for some time. This presumed hybrid was recently proposed and widely accepted as a new cryptic species, *P. solstitius* (Midsummer Tiger Swallowtail). Although recognized as likely a distinct taxonomic entity since at least the first Vermont Butterfly Atlas (2002–2007), little is known about the ecology and natural history of Midsummer Tiger Swallowtail in Vermont. Using photographic records (iNaturalist.org and e-Butterfly.org) and specimens (museum collections and Vermont Butterfly Atlas 1), we determined Vermont tiger swallowtail records to species when possible and annotated flower visits to better define phenology, biogeography, and floral interactions for these 3 species. Additionally, we highlight additional areas of natural history and ecology that are in need of study for Midsummer Tiger Swallowtail in the region.

Sat-PM2-E-3

Investigating High Predation Rates in Wood Turtles With Wildlife Cameras and Realistic Turtle Models

Julia Joos (Zoo New England, Acton, MA), Cara McElroy (Zoo New England, Acton, MA), Bryan Windmiller (Zoo New England, Acton, MA), Emilie Wilder (Zoo New England, Acton, MA), James Welch (Zoo New England, Acton, MA), John Berkholtz (Zoo New England, Acton, MA), and Matthew Kamm (Zoo New England, Acton, MA)

Abstract - *Glyptemys insculpta* (Wood Turtle) in Massachusetts exhibit higher mortality rates than other aquatic turtle species in the area due to increased predation rates. Wood Turtles are considered endangered by the IUCN, a species of special concern under the Massachusetts Endangered Species Act, and under evaluation for listing under the federal Endangered Species Act. Zoo New England has been monitoring and supplementing Wood Turtle populations in Massachusetts through headstarting efforts for several years. One goal of headstarting is to produce "predator-proof" juvenile turtles which can be safely released into the wild. However, increased mortalities have disproportionately affected headstarted Wood Turtles in some of our field sites. To gain a better understanding of predation pressures affecting Wood Turtles and how to mitigate them, we assessed predator abundance, and behavior with motion-triggered wildlife cameras placed in Wood Turtle habitat. We recorded 10-sec videoclips with 36 cameras between May and November 2024 and 2025 in three different field sites. Each camera was paired with 1 of 4 treatments consisting of a visual and/or olfactory cue: (1) a realistic Wood Turtle model, (2) a scent tube infused with Wood Turtle scent, (3) a Wood Turtle model with a scent tube, and (4) control treatment (no visual or olfactory cue). We implemented these treatments to investigate the behavior of potential Wood Turtle predators and if and how they would interact with visual and/or scent cues. Further, we compared data on predator abundance with location data from our monitored Wood Turtle populations at each site.

Sun-AM1-A-3

Effects of Prescribed Burns on Fruit-Bearing Plant Density

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

Abstract - Wildfires modify ecosystems and exert selective pressures on ecological communities. Humans have affected fire regimes directly through intentional fire suppression as well as intentional ignitions in the form of prescribed burns. Prescribed burns are used to modify landscapes for a variety of reasons, including fuel reductions for wildfire mitigation and habitat management. We investigated the efficacy of prescribed burns in improving wildlife habitat resources by producing greater density of common fruit-bearing genera across several Pennsylvania State Game Lands. We collected the relative densities and proportions of occurrence of several fruit-bearing genera including *Vaccinium*, *Gaylussacia*, *Rubus*, and *Gaultheria* through a series of transects and compared them between unburned sites and multiple PA State Game Lands burn units with varying times since last burned. Frequency and abundance of fruit-bearing plants did not have consistent relationships with burn history, differing across State Game Lands and among genera.

Sun-AM1-B-2

A Comparative Study of Spotted Turtle Nest Site Selection and Hatchling Vitality in Massachusetts and Georgia

Matthew Kamm (Zoo New England, Boston, MA), Ben Stegegna (The Orianne Society, Tiger, GA), Houston Chandler (The Orianne Society, Tiger, GA), Ivana Mali (North Carolina State University, Raleigh, NC), Justin Nowakowski (Smithsonian Environmental Research Center, Front Royal, VA), Chris Polinski (Smithsonian's National Zoo and Conservation Biology Institute, Front Royal, VA) and Thomas Akre (Smithsonian's National Zoo and Conservation Biology Institute, Front Royal, VA)

Abstract - Our research recorded temperature and soil moisture at nest locations selected by *Clemmys guttata* (Spotted Turtle) females in Massachusetts and Georgia and examined the effects of nest site on hatchling growth (weight and SCL) and vitality (assessed in righting trials). Nesting habitat varied between the 2 sites, with Massachusetts nests exclusively in *Sphagnum* hummocks within the wetland boundary and Georgia nests both in wetlands and uplands. In both locations, female Spotted Turtles selected nest locations that were significantly wetter than random in the later months of incubation (August and September), suggesting possible selection for drought survival. Females also selected for warmer-than-random sites in Massachusetts, but not in Georgia. Hatchling growth tended to be similar within clutches but showed high inter-clutch variability, especially in Massachusetts. Results of righting trials were complex but provided interesting insights to focus future research.

Sat-PM1-A-4

Comparing Hydration Performance Across a Climatic Gradient of *Plethodon cinereus* Populations

Jaden J. Kang (UR, Richmond, VA) and Kristine Grayson (University of Richmond, Richmond, VA)

Abstract - Terrestrial amphibians balance oxygen exchange via cutaneous respiration through thin, highly permeable skin with evaporative water loss. Populations across species' ranges experience environmental differences in temperature and moisture that impact this balance. The main objective of this study was to determine if there is meaningful differentiation between terrestrial salamander populations in hydration performance. We sampled 3 populations of the wide-ranging *Plethodon cinereus* (Eastern Red-Backed Salamander) across a climatic gradient in Virginia and measured dehydration and rehydration rates to estimate hydration performance. Across populations, early data suggest that variation in dehydration rates is more pronounced than in rehydration rates. Understanding how Red-Backed Salamander traits vary across a climatic gradient, whether by local adaptation or phenotypic plasticity, improves our ability to predict how this species and other terrestrial salamanders will respond to future shifts in temperature and precipitation.

Sat-AM2-D-3

Protecting Endangered and Threatened Mosses in Massachusetts

Eric. F. Karlin (Professor of Plant Ecology (Emeritus), Ramapo College, Mahwah, NJ) and Sue Williams (7 Middletown Hill Rd., Rowe, MA)

Abstract - Ever since the Massachusetts Endangered Species Act (MESA) was enacted in 1990, state protection had been limited to vascular plants. At the time of enactment, data was insufficient to establish rarity rankings for the state's moss species. However, several research projects conducted over the past 4 years provided enough information to allow for preliminary state rarity rankings. My contributions focused primarily of the genus *Sphagnum* (the peat mosses) and Sue William's focused on all other mosses. Based on these data, MassWildlife's Natural Heritage and Endangered Species Program (NHESP) approved in 2025 the inclusion of mosses with preliminary endangered (S1) or threatened (S2) rankings on the MESA Watch List. This milestone enabled (1) the inclusion of documented occurrences in the Heritage Hub and (2) the submission of formal species listing proposals. Such documentation is a prerequisite for a species to be officially listed as endangered, threatened, or of special concern. After 35 years of MESA's existence, mosses are finally being considered for official state protection. As of this presentation, I have uploaded to the Heritage Hub documentation for all known Massachusetts occurrences of 12 *Sphagnum* species and submitted comprehensive species listing proposals for each of these species.

Sat-PM1-C-2

Cultivating Connection: Bridging the Sciences and Humanities in Botanical Curricula

Rebecca Y. Kartzinel (Brown University, Providence, RI)

Abstract - Plants are foundational to human culture and society, and they have been studied through divergent methodologies across the sciences and the humanities. The importance of plants in human history is rooted in their biology, ecology, and astounding functional and morphological diversity, making the study of botany inherently interdisciplinary. However, traditional scientific botanical curricula often overlook the social, cultural, and historical contexts of plants as well as the lived experiences of the scientists and students themselves. What can we gain by bringing a humanistic perspective into the science classroom, and vice versa? Here I highlight specific educational activities that incorporate the humanities into plant biology curricula and discuss how they enhance student engagement and deepen their connection to the natural world. I will also introduce a new Botanical Humanities curriculum project designed to investigate plant life through diverse interdisciplinary frameworks. Through this curriculum, we study not only what we know about plants but also how we come to know and create value for plants. Ultimately, this approach aims to equip students with the critical tools necessary to navigate the complex and indispensable relationships between plants and humans.

Sat-AM2-A-4

Ecology of *Melitta eickworti* Alongside a Transmission Line Right-of-way

Jacob Keller (SUNY-ESF, Syracuse, NY), Michael Schummer (SUNY-ESF, Syracuse, NY), Paige Chesshire (SUNY-ESF, Syracuse, NY), and Molly Jacobson (SUNY-ESF, Syracuse, NY)

Abstract - The genus *Melitta* is diverse in the Palearctic, but represented in North America only by a handful of scarce specialists. As a result, the ecology and conservation status of these Nearctic species remains poorly understood. Here, I report on the within-patch movement and pollen collection of a large population of *Melitta eickworti* (Deerberry Blunt-horn Bee) located along a transmission line right-of-way in southern New York State. This represents a unique opportunity to document the ecology of this rarely seen species. Additionally, I will report on the estimated ranges of both the species and its host plant, *Vaccinium stamineum* (Deerberry), generated with maximum entropy ecological niche modeling. This study adds valuable information to our current understanding and can help in assessing conservation status and habitat management for the species.

Sun-PM2-B-6

Priming the Pump Together: Building a Shared Toolbox for Ecological Restoration Through Natural History Practice

Yulia Klimento (Montreal, QC, Canada)

Abstract - Ecological restoration is often framed as a technical or expert-driven endeavor, yet its foundations are deeply rooted in the observational skills, place-based knowledge, and long-term ecological awareness that natural history practitioners already hold. After introducing frameworks for ecological restoration, this interactive presentation invites participants to collectively explore how ecological restoration relates to their natural history practice, and where meaningful entry points already exist. Designed as a facilitated, participatory conversation, this presentation will draw on the collective intelligence of attendees through guided reflection, small prompts, and shared discussion. Participants will be invited to surface their own experiences with ecological change, stewardship, disturbance, and recovery, and to map how these observations align with core principles of ecological restoration. Together, we will: (1) co-define ecological restoration using practitioner language and lived experience, (2) identify overlaps between natural history practice and restoration work, (3) surface a “toolbox” of concepts, questions, and practices that natural historians can use to engage with restoration efforts, and(4) explore how practitioners can move from observation to participation, collaboration, and leadership in restoration initiatives. This presentation is intended to “prime the pump” for the rest of the sesson that follows by establishing a common foundation, shared vocabulary, and collective orientation toward restoration—grounded not in expertise alone, but in relationship, observation, and ecological literacy. Participants will leave with a clearer sense of how their skills already contribute to restoration, and how natural history communities can play a central role in shaping the future of restored landscapes.

Sat-PM1-D-1

Observing Nocturnal Flower-Visitation in the Northeastern US Using Standardized Surveys and Community Science

Adam Kohl (Oxbow Associates, Acton, MA), **Avalon Owens** (Harvard University, Cambridge, MA), Remi Christiansen (Antioch University New England, Keene, NH), and Michael E. Akresh (Antioch University New England, Keene, NH)

Abstract - If flowers are open after dark, who do they attract? Nocturnal pollination has been remarkably understudied, likely due to diurnal bias among researchers. However, recent interest in the ecological consequences of global declines in insect abundance and diversity have highlighted the importance of a more complete understanding of plant–insect interactions across the day–night cycle. To investigate nocturnal visitation to native and non-native flowering plants as well as economically important berry crops including blueberry, strawberry, and cranberry, we conducted systematic aerial net surveys and examined crowd-sourced community science observations. For the latter, we created an iNaturalist project called "Flower-visiting Moths of the Northeastern US", where anyone can help document moth–flower interactions in the region. The project so far has documented >2900 observations of >360 species, compiled by >750 participants. We will present additional preliminary results alongside several stories of success and struggle. We conclude by encouraging you to join the dark side and share what you stumble upon after dark!

Sat-AM2-E-3

Flyways, The Snipe, and other Poems

Hayley Kolding (Athens, VT)

Abstract - Often as naturalists we take the role of silent observers—stooping wordlessly to watch an ant drag its cargo; leaning back, hushed, as a *Scolopax minor* (Woodcock) does his sky dance. Writing poetry is a way for us silent observer types to play with our own capacity for song and sound, to channel our sense of wonder from the field, and to translate what happens where fact and feeling meet. In this presentation, I will read a few poems and comment on sources of inspiration and experimentation that I expect will click with other naturalists looking to incorporate more poetry into their lives. I live in southeastern Vermont, where I work in land conservation, tend a garden, and study and teach writing and ecology. I am a graduate of the Field Naturalist Program at the University of Vermont and Yale University, where I studied poetry-writing as an advisee of Louise Glück. In 2020, I taught the Eagle Hill seminar "The Poet and the Natural World". Recent publications include poems in Field Notes and Northern Woodlands (forthcoming), as well as a collaborative ecopoetic multimedia piece,Ungarden Gleanings, created with Saleem Hue Penny and featured in the Poetry Foundation's Open Door series.

Sat-AM2-F-2

Community Stability and Change in Rocky Intertidal Communities in the Northeast United States

Adam J. Kozlowski (National Park Service, Woodstock, VT), Ryan A. Beshai (University of California, Santa Cruz, CA), Pete Raimondi (University of California, Santa Cruz, CA), and Aaron Weed (Northeast Temperate Inventory and Monitoring Network, National Park Service, Woodstock, VT)

Abstract - Marine ecosystems are undergoing widespread community change—including turnover in species composition and shifts in geographic ranges—in response to persistent stressors such as climatic warming and sea-level rise. The Gulf of Maine (GoM), in particular, is warming at a rate ~99% faster than the global average, yet long-term assessments of rocky intertidal community stability in this rapidly warming system remain scarce. Here, we leverage a 12-year time series of fixed-plot, rocky-intertidal surveys from Boston Harbor, MA, and Acadia National Park, ME, to (1) assess patterns of community stability and factors that affect stability, and (2) test for vertical distribution shifts of foundation species. We found that intertidal community stability depended on the identity of the dominant species structuring the community, with elevation (vertical height above mean lower low water) further influencing stability in a subset of those species-defined assemblages. Community stability generally declined as temperature increased, and communities were particularly sensitive to warming during the coldest—rather than the warmest—parts of the year. Finally, 2 dominant algal species exhibited long-term vertical shifts in distribution. Together, our results suggest that continued warming is likely to drive increasing community dissimilarity over time in GoM rocky-intertidal communities.

Sat-AM2-B-3

New Technology Provides Insights into Biparental Chick Provisioning in Storm-Petrels

Kayla A. Kulzy (Bowdoin College, Brunswick, ME), Liam U. Taylor (Bowdoin College, Brunswick, ME), Robert A. Mauck (Kenyon College, Gambier, Ohio), Mark F. Haussmann (Bucknell University, Lewisburg, PA), and Patricia L. Jones (Bowdoin College, Brunswick, ME)

Abstract- In long-lived species, individuals must balance short-term offspring investment with long-term self-maintenance to maximize lifetime reproductive success. Individual variation in resource acquisition can allow organisms to change the terms of this life-history tradeoff. For seabirds, which are long-lived and rely on ephemeral pelagic resources when rearing young, the high cost and uncertainty of foraging may result in wide variation in both resource acquisition and resource allocation towards offspring. *Hydrobates leucorhous* (Leach's Storm-Petrel) are procellariform seabirds with biparental care, extensive pair bonds, and single-egg clutches laid in underground burrows. Parents return to the burrow at night to regurgitate lipid-rich oil to their chick during the 67-day rearing period. We used automated weigh bridges in burrow entrances and radio frequency identification to record the entry and exit masses of individual parents to determine meal sizes delivered to chicks. We quantified the influence of parent condition, parent sex, foraging yield, and foraging period in determining chick meal sizes. We also found high variation in meal sizes, both between and within breeding pairs. The combination of novel field technology and unique seabird life history allows us to accurately quantify variation in both resource acquisition and allocation while adults choose to invest in their offspring.

Sat-PM1-B-3

Changes in the Wintering Location of Bobolinks (*Dolichonyx oryzivorus*) Due to Climate Change

Emma Lake (University of New England, Biddeford, ME)

Abstract - I investigated whether *Dolichonyxoryzivorus* (Bobolink), a ~30-g, long-distance migratory songbird that relies exclusively on grassland habitats, are altering their wintering locations and timing due to climate change. I analyzed tracking data from 49 Bobolinks who wore light-level geolocators collected from a population that bred in Vermont from 2009 to 2025. I hypothesized that Bobolinks would shift their wintering grounds north across the study period. Our results indicate that the population is indeed shifting its wintering grounds north at a rate of 65.8 km per year.

Sun-AM2-A-2

Too Many Strings Attached: Microplastic Fiber Ingestion in a Maine Gull Colony

Emelia Lakebrink (College of the Atlantic, Bar Harbor, ME) and Lydia Burnet (College of the Atlantic, Bar Harbor, ME)

Abstract - Microplastics, small-scale plastic particles, are an increasingly pervasive and persistent threat to the marine environment. Microplastic particles are a diverse class of pollutants, with microfibers being among the most prevalent and methodologically accessible to detect. Seabirds are trophically vulnerable to bioaccumulation, which allows them to act as critical bioindicators for pollution levels in the ambient environment. In the 2024 and 2025 breeding seasons, we examined plastic microfiber content in the regurgitate and guano of *Larus smithsonianus* (American Herring Gull) and *Larus marinus* (Great Black-backed Gull) on Great Duck Island (44°09′08″N 68°14′55″W), an offshore island in the Gulf of Maine. We analyzed samples using a potassium hydroxide (KOH) digestive process to dissolve organic components, followed by visual analysis using a microscope. Our results reveal a consistent presence of anthropogenic microfiber particles in the fecal and regurgitated material of gulls.

Sat-PM1-B-4

Fine-Scale Microclimate Monitoring of a Disjunct Population of *Petasites frigidus* var. *palmatus* (Asteraceae) in a Large Boreal Peatland Complex in the Adirondacks of New York State

Stephen F. Langdon (Director, Shingle Shanty Preserve and Research Station, Long Lake, NY), Annie Arnold (Center for Earth and Environmental Science, SUNY Plattsburgh, Plattsburgh, NY), Mark Lesser (Center for Earth and Environmental Science, SUNY Plattsburgh, Plattsburgh, NY). Chelsea Smith (Adirondack Watershed Institute, Paul Smith's College, Paul Smith's NY), and Natalie Warner (Clarkson University, Potsdam NY)

Abstract - *Petasites frigidus* (L.) Fr**.** var. *palmatus* **(Aiton) Cronquist** (Sweet Colt's Foot, Butterbur) is an herbaceous perennial angiosperm with a boreal distribution in North America. In New York State, there are fewer than 6 known populations of Sweet Colt's Foot and 20 historic populations, and the species is thus ranked as critically imperiled statewide. We incidentally observed a population of Sweet Colt's Foot at the Shingle Shanty peatland complex in the western Adirondacks of New York State (Town of Long Lake, Hamilton County, NY) when deploying microclimate-monitoring data-logger arrays during late spring of 2022 in adjacent forested and open peatland vegetation communities. These microclimate data-logger arrays have been deployed continuously since 2022 recording (1) temperature at 1 m height, (2) groundwater level, (3) groundwater temperature, and (4) precipitation (in non-winter months) every 2 hours. We describe vascular plant species associations, microclimate, and pore-water chemistry of the site, and discuss both terrain- and ecosystem-mediated factors contributing to this disjunct boreal species refugia. Our approach may be useful for monitoring and fine-scale modeling of rare species distributions throughout the Northeast.

Sun-AM2-C-1

From Death Strip to Life Line: Natural History of a Cold War Border

Kerstin Lange (South Burlington, VT & Wendland region, Germany)

Abstract - When the Berlin Wall fell under the pressure of peaceful protests 35 years ago, the 1448-km (900-mi)-long border that had separated the 2 German states also became obsolete. During the 4 decades that humans were kept out by brutal means, this narrow strip of land became a refuge for more than 1200 rare plant and animal species. What led to this remarkable increase in biodiversity? Can this irony of history help us live as if the Earth were our ecological home?

Sun-PM2-D-4

Uncovering Trends and Biases in the Northern Appalachian Herbarium Record

Olivia Leek (University of Cincinnati, Cincinnati, OH), J. Mason Heberling (Carnegie Museum of Natural History, Pittsburgh, PA), Theresa Culley (University of Cincinnati, Cincinnati, OH), and Eric Tepe (University of Cincinnati, Cincinnati, OH)

Abstract - The Northern Appalachian region, a culturally and biologically diverse area, has been subjected to systematic exploitation of natural resources for centuries resulting in drastic landscape alternations. While coordinated regional herbarium-digitization efforts and subsequent bias-assessment research has focused on different regions around the world, the Northern Appalachian region, with few large population centers or major universities, has been largely overlooked. This study describes the herbarium record, and the spatial, temporal, and taxonomic patterns of collections across Northern Appalachia (as defined by the Appalachian Regional Commission) to assess any gaps or biases in the herbarium record. We integrated specimen data from various digital repositories, including The Global Biodiversity Information Facility (GBIF), Consortium of Northeast Herbaria (CNH), the Southwest Environmental Information Network (SEINet), and additional locally hosted data sent from regional institutions, to create a dataset of all digitized collections from the region. A total of 779,771 records were available digitially for this study, archived in 335 herbaria around the world, and 58% of records were located within regional institutions. There was an overall decline in the number of collection events per year across the region since the peak in 1940. Patterns of collections across Northern Appalachia were uneven and vary within states, which highlights the fact that locations of herbaria, habits of collectors, and other factors can have major impacts on the evenness of collections across a region. Future research and applications of herbarium records are dependent on addressing and accounting for these trends and biases. These results also emphasize the need for continued collections, greater visibility and digitization of regional herbaria, and highlight the need for floristic studies focused on this understudied region of Appalachia.

Sat-AM2-C-2

Challenges and Opportunities for Using Herbaria to Study Changes in Northeast Ecosystems

James Lendemer (New York State Museum, Albany, NY)

Abstract - Characterizing past baselines and comparing them to modern benchmarks is increasingly urgent in an era characterized by rapid change. Natural history collections have long played a key role in such studies of how environments have changed over time. Nonetheless, utilizing natural history collections for this purpose presents unique and complex challenges. These challenges often increase with the age of the baseline being studied, and include issues as simple as locating physical collections, to those as complex as coordinating and interpreting complementary data sources across multiple institutions in disparate locations. This presentation will highlight some of the challenges and opportunities involved in using herbaria to study how ecosystems in the Northeast have changed over time.

Sat-AM2-C-3

The State of New York Herbaria

James Lendemer (New York State Museum, Albany, NY), Patricia Kaishian (New York State Museum, Albany NY), Diana Murphy (New York State Museum, Albany NY), Sean Robinson (SUNY Oneonta, Oneonta, NY), and New York State Herbarium Consortium (30+ contributors from institutions, NY)

Abstract - Herbaria are indispensable resources that serve diverse roles from scientific references to cultural touchstones. There are hundreds of herbaria in the US and dozens in New York. This presentation will focus on a collective effort to build a network linking together New York State herbaria and the communities that steward them. Using data from across New York, the group developed a comprehensive assessment of the status of these collections, degrees of digitization and gaps in coverage. We highlight stories of preservation and discovery, place New York State herbaria in the broader context of the those elsewhere in the Northeast and North America, as well as within the context of existing digital biodiversity data resources.

Sun-PM2-C-6

The Conservation Value of Silvicultural Systems for Breeding and Post-Fledging Forest Birds in Southwestern New Hampshire

Christopher Liazos (Antioch University New England, Keene, NH) and Michael Akresh (Antioch University New England, Keene, NH)

Abstract - Forest bird communities (FBCs) in the Northeast are declining due to an overabundance of homogenous mature forest cover. Silviculture, the art and science of forest management, serves as a conservation tool by creating areas of interspersed young and structurally complex mature forests. We explored the relationship between FBC conservation-value indexes and basal area and canopy cover in both harvested and unharvested forests by conducting bird point counts and vegetation surveys across southwestern New Hampshire over the course of 2 years. Additionally, in the second year, we conducted post-fledging surveys using point counts and playback methods. Our models found higher conservation values in young and mature forests with low or moderate canopy cover than in forests with high canopy cover. These findings support the idea that open- and mixed-canopy stands provide better habitat for FBCs as well as specific species, despite being underrepresented in New Hampshire's forested landscape. Our research underscores the importance of silviculture as a conservation tool for supporting FBCs during both the breeding and post-fledging seasons.

Sun-AM2-A-4

From Curiosity to Climate Sentinel: A Brief History of Alpine Botany in the Northeastern US

Braedon Lineman (University of Maine, Orono, ME)

Abstract-Alpine ecosystems of the northeastern US occupy only a tiny fraction of the regional landscape, yet they have played an outsized role in the development of American botany, ecology, and conservation science. From the earliest European-American naturalists, the presence of Arctic–alpine plants on isolated summits such as Mount Washington posed a striking biogeographic puzzle: why do cold-adapted floras persist so far south of their primary ranges? This talk offers a history of northeastern alpine botany and ecology, tracing how scientific interpretations of these summit communities have shifted over the past 2 centuries from floristic curiosity, to evidence of deep time and post-glacial migration, to modern frameworks of ecological process, conservation, and climate change.

Sun-AM2-E-

How Floral Nutritional Landscapes Shape Bee Foraging in Northeastern North America

Christian Liriano (CUNY, New York, NY)

Abstract - Bees in northeastern North America depend on diverse floral communities that differ substantially in pollen nutritional composition. Across this region, ongoing changes in land use, plant community structure, and phenology are altering not only the abundance of floral resources, but also their nutritional quality. Understanding how bees respond to this variation is essential for predicting pollinator persistence in temperate ecosystems. In this talk, I explore how pollen macronutrient heterogeneity across northeastern North American plant species may influence bee foraging behavior and nutritional intake. Drawing on empirical data describing variation in pollen protein and lipid content, I use a spatially explicit, individual-based model to simulate bee movement and patch selection within nutritionally complex landscapes. The model incorporates nutrient-regulation rules derived from experimental studies of solitary bees and allows individuals to make state-dependent foraging decisions. Results highlight how landscape-scale nutritional structure can mediate bees' ability to balance nutrient intake, even when floral abundance remains high. This work emphasizes the importance of considering floral nutritional quality alongside species richness and floral density when evaluating habitat suitability for bees in northeastern North America.

Sun-PM2-B-1

The Teaching Gardens: Where Science and Literacy Meet

Valerie Bang-Jensen (Saint Michael's College, Colchester VT) and **Mark Lubkowitz** (Saint Michael's College, Colchester VT)

Abstract - The Teaching Gardens were designed and implemented by Saint Michael's College students, led by a collaboration between professors in the Biology and Education Departments. Each of the 4 garden (Books in Bloom, Native Plants, International Garden, and Word Garden) serve to support various scholarly projects and also push the boundaries of the definition of "garden". The gardens invite play, study, and physical involvement. Join us for a tour exploring the 4 gardens and the role they play on campus in various disciplines, from the humanities to the sciences.

Sat -PM2-F-6

Alternative Final Exams for Field Ecology: a Film, a Podcast, a Field Journal

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

Abstract - I teach an undergraduate field ecology course each spring at Barnard College's Environmental Science Department in NYC. Learning goals include mastery of ecology principles, field survey techniques, bird and plant identification, data analysis/presentation, and writing in scientific and field-journal formats. Students study the impacts of climate change, land-use issues, and non-native species on birds and plants through field trips, data labs, lecture, student presentations, and readings. In an effort to capture a student's ability to function independently in the field, students were prompted to produce media as alternative final assessments. The podcast required a 2-minute audio recording incorporating at least 3 identified vocalizations and a discussion of 1 specific ecological interaction. The film required a 3-minute narrated visualization of 5 identified species (across fungi, insects, birds, or mammals) in association with specific plant communities. The field journal required documentation of 5 birds and 5 plants in a habitat of the student's choice. While creating these media tasks, students reported increased motivation to engage with the local landscape and that the experience felt less like an exam and more like professional field work. The rigor of the other graded assignments (labs, traditional exams, and reading quizzes) allowed the final assessment to be more experimental and creative without lowering academic standards.

Sat-AM2-A-2

Metallic-Sweat Bees of the Northeast: Practical Approaches to Dialictus Identification

David Mantack (Southern Connecticut State University, New Haven, CT; Connecticut Agricultural Experiment Station, New Haven, CT)

Abstract - The metallic-sweat bees in the subgenus *Lasioglossum* (*Dialictus*) are among the most abundant and frequently collected pollinators in northeastern North America, yet they are widely regarded as one of the most intimidating groups to identify. High species richness, subtle morphology, intraspecific variation, and a historically complex taxonomy have led many collectors to avoid identifying *Dialictus* altogether, instead sending specimens to a small number of specialists. In this talk, I provide an overview of *Dialictus* taxonomy and diversity, then argue that successful identification is less about immediately mastering keys and more about building familiarity, visual pattern recognition, and comparative context. Using side-by-side images of diagnostic features and examples from my own learning process, I will demonstrate how morphosorting, regional filtering of species lists, the development of a mental "search image," and other techniques can dramatically simplify identification. I will also discuss the importance of series-based collecting, reference collections, habitat context, and specimen preparation. By emphasizing familiarity, comparison, and pattern recognition rather than immediately jumping into keys, I aim to show that many specimens currently left unidentified could be reliably determined by the people already collecting them, and that being cautious, comparative, and occasionally uncertain is not failure or a lack of capability, but good taxonomy.

Sun-AM2-B-4

Long term (>30 yr) Freshwater Mussel Population Trends in the Missisquoi and Poultney Rivers (VT)

Paul Marangelo (Montpelier, VT) and Michael Lew-Smith (Arrowwood Environmental, Huntington, VT)

Abstract - We conducted quantitative and qualitative freshwater mussel surveys in the lower Poultney and Missisquoi rivers in 2025 to assess lon- term population changes, re-surveying quantitative sites that I first sampled in 1997 (Poultney River) and 1998 (Missisquoi River). Situated in the Lake Champlain basin, the lower portion of these rivers harbor the most diverse mussel fauna in New England, with records of 13 species. The Poultney River results yielded somewhat equivocal evidence that suggests long-term population decline, although we observed increase at 1 quantitative site. Results from the Missisquoi River suggested long-term persistence of productive mussel habitats for both rare (state threatened and endangered) and common species. Some individual species exhibited marked changes over the past few decades: *Lampsilis cardium* (Pocketbook) showed evidence of decline in both rivers, as well as *Lasmigona costata* (Fluted Shell) and *Leptodea fragilis* (Fragile Papershell) in the Poultney. However, *Anodontoides ferrusicianus* (Fragile Papershell), and *Potamilus alatus* (Pink Heelsplitter) in the Missisquoi and Poulntey, respectively, increased or remained at comparable densities. Among species not considered threated and endangered, *Lampsilis radiata* (Eastern Lamp Mussel) increased in abundance in both rivers over the past 30 years. In the Poultney, it appears that a dynamically changing river channel from chronic fluvial geomorphic instability may be aggregating up to system-wide population decline; old productive habitats become destabilized, and in turn, while new favorable habitats may appear, mussels seem to be unable to adequately recruit into these areas. This effect appears less pronounced in the Missisquoi, where less extensive physical habitat changes were observed. Notable species findings were the first detection of live *Ligumia recta* (Black Sandshell) from the Poultney since the mid-1990s and the first recorded detection of live *L. costata* from the Missisquoi River.

Sat-PM2-B-4

Rewilding the Curriculum

Kirsten Martin (University of Saint Joseph, West Hartford, CT), Jesse Balaban-Feld (University of Saint Joseph, West Hartford, CT), and Annette Evans (University of Saint Joseph, West Hartford, CT)

Abstract - The University of Saint Joseph (USJ) Grassland Habitat, established in 2015, features a tall-grass space with 2 meadow-style pollinator gardens, The habitat is free of pesticides and herbicides, adhering to an environmental standard established for the entire campus. The grassland habitat serves as a living laboratory for the USJ Environmental Science Program, the Biology Department, and other majors on campus. The space provides students and community members with hands-on experience in sustainability and conservation. The designation of the USJ Grassland Habitat coincided with a "rewilding the curriculum" initiative started by Kirsten Martin and other science faculty. Prior to this time, the existing biological science curriculum lacked any environmental science courses, and students only experienced traditional indoor science laboratories. Since 2015, the USJ Grassland Habitat has become embedded into both the science curriculum as well as humanities courses and has served as the springboard for creation of other community-based environmental service/learning projects as well as the creation of USJ's BS in Environmental Science. In this presentation, we will talk about how we utilize the USJ Grassland Habitat in our curriculum. We will also talk about some of the other "rewilding the curriculum" projects we have initiated.

Sun-AM2-F-4

Decoding the Evolutionary History of Toothed Whales' Tonal Sounds Repertoire: Reflections and Challenges

Laura J. May-Collado (University of Vermont, Burlington, VT)

Abstract - Recent research suggests that toothed whales possess anatomical specializations enabling lateralized register vibrations, contributing to rich vocal repertoires. Combined with vocal learning abilities, this points to highly complex communication systems. Yet the evolution of this complexity remains unclear due to limited standardized analyses. This study examines tonal repertoires from 15 species using 500 randomly selected contours per species to quantify vocal diversity, composition, complexity, and acoustic structure, and to reconstruct trait evolution. Preliminary results show that diverse, high−frequency, and complex repertoires are most common in socially dynamic Delphinidae. These findings provide a foundation for understanding toothed-whale vocal evolution.

Sat-AM1-D-1

Redesigning Campus for Biodiversity Education and Research

Declan McCabe (Saint Michael's College, Colchester VT)

Abstract - College and university campuses occupy significant land areas. In light of the current biodiversity crisis, it is incumbent upon educational institutes to play leadership roles in advancing biodiversity conservation, and the lands stewarded by these institutions provide obvious educational, research, and applied opportunities to directly move the biodiversity needle. Providing conservation education is mission-critical for institutions offering environmental and biological science programs, but all institutions have a moral obligation to better steward the precious resource that is the land they occupy. By collaborating with administrators and facilities professionals, academics engaged in conservation education and research can help redesign campuses to increase biological diversity. In addition to meeting broader societal obligations to protect the biological legacy of our planet, such redesigns can provide built-in study sites for educational and research projects. The Teaching Gardens at Saint Michael's College, developed by Valerie Bang-Jensen and Mark Lubkowitz combine elements designed for literacy education with a garden featuring native plants of Vermont. The Books in Bloom component of this garden includes privet to represent Harry Potter, but this shrub also happens to be a non-native species. Comparing insect visitation to privet as compared to native vegetation serves as a valuable laboratory exercise requiring zero preparation time. Similarly, the Pollinator Garden developed by Kristyn Achilich, Tree Nursery planned by Trevien Stanger, Spiral Garden installed by Brian Collier, Farm overseen by Christine Gall, and the No Mow zones established by our Facilities Department, all serve as built-in laboratories that support several courses across our curriculum. All of these sites began as mowed lawns that by virtue of collaborations between our Facilities Department and academic faculty in Environmental Studies, Biology, and Fine Arts Programs, and The Patrick '61 and Marcelle Leahy Institute for the Environment, have become valuable teaching facilities. Moreover, by replacing sterile lawn with biologically rich vegetation, these sites contribute directly to biological diversity and to the broader food web of our campus. We have gone from speaking in the classroom about positive things that can be done for biodiversity, to actually enhancing biological diversity, modeling that behavior for students, and measuring biodiversity responses in our classes. E.O. Wilson developed and advanced the "Half Earth" concept to devote half of Earth to supporting biological diversity; we model that concept by setting more than half of the Saint Michael's College campus aside as a natural area. Doug Tallamy's "Homegrown National Park" concept encourages us to manage our personal properties for biodiversity; this concept is been applied between the buildings, sidewalks, and parking lots of the built portions of our campus. With some forethought, planning, and active collaboration with academic administrators, these ideas can be applied to tailor most campuses to foster biodiversity while simultaneously advancing biodiversity education and research.

Sat-PM2-F-1

From Neglect to Restoration: Transition to Active Habitat Restoration in the Saint Michael's College Natural Area

Declan McCabe (Saint Michael's College, Colchester VT)

Abstract - In 1904, the Society of St. Edmund purchased the Kelley Farm on the Colchester–Essex Vermont town line. The Edmundites maintained a dairy herd that provided milk to the campus community and local markets until 1965. More than 26 ha of the site were leased for extractive *Zea mays* (Corn) production until 2018. In the 1970s, a tree nursery operated on site. Aerial photographs from the 1930s reveal a patchwork of fields surrounding isolated forest pockets. One such *Acer saccharinum* (Silver Maple) forest was on a Winooski River island separated from the college property by a side river channel. The river channel shifted after the 1960s leaving an oxbow and joining the former island to college property. A hill-top forest patch is dominated by *Pinus strobus* (White Pine), and tree-core data have extended the age of this forest patch to 165 years. The College Board of Trustees established the Saint Michael's College Natural Area in 2018. In 2020, the College closed on a Wetland Reserve Easement covering ~1/3 of the site that includes wetlands, floodplain, and connected upland habitat. Several academic departments under the auspice of the Institute for the Environment have coordinated efforts to plant trees, manage invasive species, and measure biological diversity. Our focus has been to plant native, diverse trees to underpin the food web. Self-seeded floodplain species include *Populus deltoides* (Eastern Cottonwood), *Salix nigra* (Black Willow), *Alnus incana*, (Speckled Alder), and Silver Maple. Trees growing since the last Corn harvest in 2018 now exceed 6 m in height and support an active *Castor canadensis* (North American Beaver) population. *Platanus occidentalis* (American Sycamore) has been our most successful planted species because it resists *Odocoileus virginianus* (White-tailed Deer) browse and grows successfully in habitats dominated by *Phalaris arundinacea* (Reed Canary Grass). Elimination of floodplain farming has transitioned the site from a source of eroded phosphorus-enriched soil to a location that intercepts and accumulates deposited soil from upstream. eBird users have documented 194 bird species onsite. The Natural Resources Conservation Service has hired contractors to reduce the abundance of several invasive species. This restoration site provides educational and research opportunities for Saint Michael's College student and faculty while simultaneously contributing to enhancing biological diversity in the Lower Winooski River Valley.

Sun-AM1-D-3

Reading and Knitting the Forested Landscape

Caitlin McDonough MacKenzie (Bennington College, Bennington, VT)

Abstract - Why would a forest ecology course include an assignment to knit a wool hat? Sheep, and especially a 19th-century boom in merino sheep, radically altered New England's forests and inspired early writing on conservation and sustainable land management. I have taught Reading and Knitting the Forested Landscape in Maine and Vermont, as a 4-week January course and a semester-long intro-level ecology course. We read *Reading the Forested Landscape* and George Perkins Marsh, visit a small batch fiber mill and our campus forest, experiment with botanical dyeing and herbarium specimens, and every single student (including complete beginners) knits a hat. In this talk, I will share my approach to blending fiber arts and landscape ecology. As one of my students wrote last spring, "the process of knitting itself mirrors ecological patterns—it requires attention to structure, repetition, and adaptability".

Sat-PM2-A-1

The Campus Sugarbush as a Natural History Laboratory

Caitlin McDonough MacKenzie (Bennington College, Bennington, VT)

Abstract - Maple sugaring as an academic venture in biology invites students to explore botany, ecophysiology, and traditional ecological knowledge with hands-on, active learning. In this talk, I'll share my experience teaching in the Bennington College sugarbush through a 7-week maple-sugaring tutorial and a full-semester seminar for a cohort of freshmen. When the sugarbush is a classroom, students can apply winter tree-identification skills and a conceptual understanding of the physiology and phenology of sap runs to determine which trees to tap and when. Students read peer-reviewed research and Indigenous writers to understand the traditional ecological knowledge framed in sugaring, how climate change impacts the geographical range of *Acer saccharum* (Sugar Maple) trees, the sugar content in sap, and the seasonal timing of the sap runs. The physical work of processing sap connects students to foodways and a sense of place on the landscape; the relationships that students create with their sugarbush adds new dimensions to perspectives provided by other ecology classes, labs, and recreation in the same forest. This academic and practical work requires community and cooperation as students steward a working forest and create maple syrup together. Colleges and universities across the Northeast tap campus trees with students in an assortment of classes, tutorials, field trips, and extracurricular activities. Bennington students catalogued academic sugaring opportunities from across the region to build community and connection across campus sugarbushes. We present this survey of the sugarbush as a college classroom and our preliminary results on the pedagogy of sugaring in higher education.

Sun-AM2-F-5

Butterflies in Decline: A Call for Collaborative Conservation in New England

Kent McFarland (Vermont Center for Ecostudies, White River Junction, VT)

Abstract - During the first 2 decades of this century, butterfly abundance in the Northeast fell by 33% across 108 species, with more than twice as many species declining than increasing. The true extent of decline is likely greater, as many species have limited data, small populations, and occupy specialized habitats. We collated butterflies designated as species of greatest conservation need in the 2025 state wildlife action plans across New England, along with federal and state endangered species and other conservation status listings, and compared those to known changes in abundance over the last few decades. The scope and scale of population declines and number of species of conservation concern suggest multiple, broadly acting threats—including habitat loss, climate change, and pesticides—highlighting an urgent need for coordinated conservation action. Since 1990, Partners in Flight has successfully employed a collaborative, regionwide, science-based approach for bird conservation. I advocate for a similar model for butterflies, bringing together government agencies, non-governmental organizations, academic institutions, and industry leaders to develop a regionally scaled conservation strategy through collaborative, applied science.

Sat-PM2-E-6

From Observation to Action: Can Trail Cameras Help Us Make Better Small-Scale Land Decisions?

Jaime McGuigan (Access Conservation, Marlow, New Hampshire) and Peter Palmiotto (Department of Environmental Studies, Antioch University New England, Keene, NH)

Abstract - Trail cameras do more than record species lists; they help us look closely at how wildlife uses the landscapes we manage and protect. This presentation blends ecological research, conservation practice, and public engagement through stories and footage I collected over 6 months at 2 small conservation parcels in southwestern New Hampshire. Using 28 trail cameras at Glover's Ledge in Langdon, NH, and Distant Hill Gardens and Nature Trail in Walpole and Alstead, NH, I gathered >4600 camera-hours of recordings, providing insight into species richness, movement patterns, and behavior at a scale relevant to parcel-level management. While overall richness remained similar, fine-scale patterns diverged. Glover's Ledge supports greater spatial and temporal partitioning shaped by complex upland and successional habitats, whereas Distant Hill, with more riparian habitat and higher human visitation, shows greater overlap among mesocarnivores (e.g., *Lynx rufus* (Bobcat), *Canis latrans var.* (Eastern Coyote), *Procyon lotor* (Common Raccoon)). Travel data indicates wildlife at Distant Hill more often follow trails and streams, while movement at Glover's Ledge is more diffuse. The footage also highlights biodiversity hotspots, breeding activity, and cross-boundary corridors, offering cost-effective guidance for stewardship priorities, trail placement, and adaptive management. Collectively, these findings show how habitat complexity and human use shape biodiversity on small parcels. Beyond research, trail cameras serve as powerful engagement tools, transforming observation into understanding and data into stories. When footage captures intimate behaviors, such as Bobcat kittens bounding after their mother or *Ursus americanus* (American Black Bear) cubs startled by their own reflections, it deepens ecological insight and strengthens our connection to the wildlife around us.

Sun-PM2-D-1

Evaluating Genetic Divergence of *Elliptio complnata* in New York State Watersheds

Rowan Mentley-Peters (SUNY Oneonta Graduate Program, Oneonta, NY), Paul H. Lord (SUNY Oneonta, Biology, Oneonta, NY), and Alex Sotola (SUNY Oneonta, Biology, Oneonta, NY)

Abstract - Freshwater pearly mussels play an integral role in freshwater ecosystems. *Elliptio complanata* (Eastern Elliptio) hereinafter referred to as Elliptios, was once the most abundant and widespread freshwater pearly mussel (FWPM) in the Mid-Atlantic region, with historic densities varying from 10 mussels/m^2 to 100/m^2 in beds of large rivers. FWPMs stabilize substrates and improve water quality. Elliptios, a keystone species, modifies benthic environments and increases habitat heterogeneity. While surveying the upper tributaries in the Susquehanna River watershed (SRW), we observed FWPMs populations. We recorded qualitative data on FWPM species distribution, preferred habitat and conditions that permit their survival. We observed Elliptio populations to be comprised of old individuals and lacking recruitment. We believe this situation to be driven by obstructions to preferred host fish, *Anguilla rostrata* (American Eel). Alternatively, the upper Delaware River watershed (DRW) supports >1,250,000 mussels per km (>2 million mussels per mi), accredited to zero main stem dams. We observed Elliptios occupying cobble substrate in large assemblages in the DRW and rarely surviving to 1/3 of the lifespan exhibited by Elliptios in the SRW. We suspect Elliptios to have diverged genetically between watersheds. We collected Elliptio DNA by swabbing individuals from 8 New York waterbodies, including the St. Regis River. We utilized genome-wide sequencing for genetic sequencing to produce a reduced-representation genomic library for each individual. We digested genomic DNA with 2 restriction enzymes, followed by ligation of adapters that include an 8–10-base pair barcode and Illumina priming sequences. DNA fragments were amplified with PCR, combined into a multiplexed library and sequenced at 1.8 billion reads on an Illumina NextSeq 2000 P3 machine at SUNY Upstate Medical. We are currently processing data from 192 individuals on a high-performance computer at SUNY Oneonta. Our analysis intends to higlight genetic differentiation necessary to outline historical and current geneflow so we may best understand how to conserve these animals of great need.

Sat-PM2-B-2

Beneath the Surface: Assessing the Abundance and Spatio-Temporal Distribution of Microplastics in Lake Champlain and its Tributaries

Allison Morrow (SUNY Plattsburgh, Plattsburgh, NY), Monique Faubert (SUNY Plattsburgh, Plattsburgh, NY), Grace Calvelli (SUNY Plattsburgh, Plattsburgh, NY), Timothy Lloyd (SUNY Plattsburgh, Plattsburgh, NY), Taygin Jump (SUNY Plattsburgh, Plattsburgh, NY), Timothy Mihuc (SUNY Plattsburgh, Plattsburgh, NY), Danielle Garneau (SUNY Plattsburgh, Plattsburgh, NY), Nurjahan Begum (University of Vermont, Burlington, VT), Andrea Stumpf (University of Vermont, Burlington, VT), and Anne Jefferson (University of Vermont, Burlington, VT)

Abstract - Microplastics are an increasing concern in the environment, with global plastic production growing at an annual rate of 8.4% from 1950 to 2015. Once discarded, plastics fragment into smaller pieces, including microplastics (<5 mm), which enter ecosystems through land-cover runoff, wastewater effluent, airborne deposition, and improper disposal. These particles accumulate in rivers, lakes, and other waterbodies, potentially affecting aquatic organisms and ecosystem health. This research investigates microplastic pathways, distribution, and loading in Lake Champlain and its tributaries, and retention within local fish communities. Our preliminary surveys in 2024 sampled 10 tributaries across New York and Vermont, while 2025 efforts focused specifically on the Saranac, Ausable, Lamoille River, and Otter Creek. We analyzed historic whole-lake samples from the Long-Term Monitoring Program (1992–2025) to determine microplastic concentrations across 15 lake stations. We used data from previous wastewater treatment plant surveys (2016–2018) across New York and Vermont to assess post-treatment effluent contributions. We examined ~103 fish from Lake Champlain to quantify microplastic retention. Results indicate fibers are the dominant microplastic type in New York rivers and across Lake Champlain, with larger rivers, especially the Saranac River and Otter Creek, contributing the greatest quantities. Wastewater treatment plants were significant microplastic sources, with particle morphology varying by facility. Fish results revealed primarily fibrous microplastic retention in digestive tracts. By identifying pathways, distributions, and retention patterns, this research establishes a baseline for microplastic contamination in the basin and provides information to guide management and public awareness initiatives.

Sat-AM1-A-2

When "Invasive" Becomes Climate-Enabled: Forecasting Avian Range Shifts and Ecological Integration

Ian R. Mowatt (University of Southern Maine, Environmental Science and Policy, Gorham, ME) and Joseph K. Staples (University of Southern Maine, Environmental Science and Policy, Gorham, ME)

Abstract - Climate change and human land use are rapidly reshaping avian distributions, creating novel species interactions that challenge traditional conservation classifications. This study uses species distribution modeling and ecological forecasting to examine climate-driven range shifts in *Myiopsitta monachus* (Monk Parakeet) and the hybrid zone between *Poecile atricapillus* (Black-capped Chickadee) and *P. carolinensis* (Carolina Chickadee). We integrated occurrence data from citizen science databases with high-resolution climate variables using DYMEX/CLIMAX to project current and future suitability of habitat. Results indicate expanding climatic suitability for Monk Parakeets across urban regions and continued northward movement of Chickadee hybrid zones linked to warming winter temperatures. These patterns suggest that many species labeled as "invasive" reflect climate-enabled dispersal rather than ecological disruption alone. The findings highlight how static conservation categories fail to capture dynamic species responses in the "Anthropocene" and support more adaptive, function-based approaches to biodiversity management.

Sun-PM2-A-1

Allelochemical Effects of Two Native Plants on Invasive Species in New York State

Lori Murphy (SUNY Oneonta, Oneonta, NY) and Miranda Kearney (SUNY Oneonta, Oneonta, NY)

Abstract - Allelopathy is the release of biologically active compounds by plants that can impact the germination, reproduction, and development of neighboring species. This phenomenon plays an important role in plant community structure and interactions. Although allelopathic effects are associated with the success of invasive species, many species native to the northeastern US also produce these secondary compounds capable of inhibiting competitors, suggesting a potential role for native allelopathy in invasive species control. However, literature regarding the subject, while growing, is still relatively limited. More research is needed to explore the potential role that allelopathic native plants could play in facilitating ecological restoration in locations impacted by potentially susceptible invasive plant species. This study examined whether plant matter from 2 native northeastern species, *Juglans nigra* (Black Walnut) and *Solidago gigantea* (Late Goldenrod), have inhibitory effects on the seed germination and growth of 2 widespread invasive plants, *Microstegium vimineum* (Japanese Stiltgrass) and *Alliaria petiolata* (Garlic Mustard). This study is composed of 2 parts. In a laboratory experiment, we exposed seeds of both invasive species to leachates from the native species in various concentrations and a water control group. In a field experiment, we assessed the effects of native leaf litter applied directly to an invaded site during the early stages of development. We separated this site into 30 equal sections and took measurements for height, morphology, and health status throughout the growing season. We hypothesized that the exposure to native allelochemicals would significantly reduce invasive seed germination and suppress early growth relative to controls. By integrating laboratory and field experiments, this research evaluated the ecological relevance of native allelopathy and its potential application as a biologically based strategy for limiting invasive plant success and supporting restoration efforts in northeastern ecosystems.

Sun-PM2-A-5

Tracking Ten Thousand Years of Semiaquatic Furbearer Ecology and Harvest in the Northeast

Alexis M. Mychajliw (Middlebury College, Middlebury, VT), Shrushti Modi (Wildlife Institute of India, Chandrabani, India), and Courtney A. Hofman (University of Oklahoma, Norman, OK)

Abstract -The North American Fur Trade profoundly reshaped populations of furbearing mammals, with cascading impacts on ecosystem structure and the disruption of millennial-scale human–wildlife relationships. We leveraged a combination of paleontological, zooarchaeological, natural history, and modern samples to evaluate populations of *Castor canadensis* (North American Beaver), *Ondatra zibethicus* (Muskrat), and *Neogale vision* (American Mink) prior to, during, and after the Fur Trade in New England. We generated new radiocarbon dates on these taxa to reveal their shifts in distribution across the Holocene and persistence across the colonial harvest period. Genomic and isotopic analyses reveal changes in population size and ecology. Altogether, we present a socio-ecological-systems framework for monitoring the ongoing management successes and challenges of these taxa.

Sat-PM2-C-6

Diversity, Endemism, and Conservation Concerns of Fen-Associated Beetles in the Northeastern United States

Matt Naczi (Western Connecticut State University, Danbury, CT)

Abstract - The northeastern US is home to a rich diversity of beetles (Coleoptera), many of which are associated with wetlands. Ecological studies have established that beetles are critical to the health of fens and contribute a major portion of their insect biomass. However, studies focused on beetles in fens have either been narrow in scope or have been mostly conducted in Europe. No comprehensive study has been made of the biology and diversity of fen-associated beetles in North America. With this project, I have paired field-work with collections-based research to document the taxonomic composition and natural histories of wetland beetle assemblages. I have found that geographic information systems (GIS) and literature reviews are useful for establishing the known biogeography of beetle groups as well as predicting their locations. My efforts have identified species of beetles that are rare and endemic to northeastern wetlands and are of conservation concern. Notable among these are a species of aquatic leaf-beetle (Chrysomelidae: Donaciinae) and a rare click beetle (Elateridae) that appear to be in steep decline. Additionally, this project has revealed serious threats to the health of fens and the conservation of the beetles they host. It is critical that we increase our efforts to protect rare insect communities and their habitats.

Sun-AM1-F-3

Scaling Up Plant–Pollinator Interaction Data with iNaturalist Observations

Desiree L. Narango (Vermont Center for Ecostudies, White River Junction, VT), Michael T. Hallworth (Vermont Center for Ecostudies, White River Junction, VT), Amber Jones (Vermont Center for Ecostudies, White River Junction, VT), Pablo Sosa-Negrón (Universidad de Costa Rica UCR, San José, Costa Rica), and Ryan Rebozo (Vermont Center for Ecostudies, White River Junction, VT)

Abstract - Opportunistic data collected by community scientists are increasingly valuable for conservation research. Platforms like iNaturalist now generate thousands of occurrence records annually, and their use in scientific research has increased tenfold over the past 5 years. While most iNaturalist studies have focused on community composition, species distributions, or occupancy modeling, many observations also document species interactions, such as those between plants and pollinators. Mining these data offers the potential to generate insights across larger spatial and temporal scales than previously possible. Building on this potential, in 2023, we initiated a regional synthesis of plant–pollinator-interaction data across the northeastern United States. The Pollinator Interactions on Plants (PIP) project is a community-focused initiative that engages volunteers in collecting and annotating flower-visitation records. These records have been combined with additional large-scale datasets and published resources, resulting in over 550,000 spatially and temporally explicit plant–pollinator observations. This dataset captures fine-scale information on pollinator floral use that can be leveraged to address conservation questions at regional scales. In this talk, we present the framework and workflow of the PIP project, strategies for volunteer engagement, and comparisons between iNaturalist and other interaction datasets to illustrate the scale and potential of inference. We also highlight challenges associated with opportunistic community science data and present a case study analyzing *Archilochus colubris* (Ruby-throated Hummingbird) –flower interactions across the region. Through this project, we aim to synthesize plant–pollinator interaction data at broad scales and welcome collaborators to contribute additional observations.

Sat-AM2-E-2

Does Plant Ecotype Matter For Pollinator Support? Insights from a Common Garden Experiment

Desiree L. Narango (Vermont Center for Ecostudies, White River Junction, VT), Amber Jones (Vermont Center for Ecostudies, White River Junction, VT), Spencer Hardy (Vermont Center for Ecostudies, White River Junction, VT), and Ryan Rebozo (Vermont Center for Ecostudies, White River Junction, VT)

Abstract - Whether to plant local or non-local ecotypes remains a contested issue in ecological restoration; however, most studies have focused on plant establishment and performance, with relatively few evaluating trophic interactions with other organisms. At the same time, interest in native-plant gardening has increased substantially, while limited horticultural availability of locally sourced native seed and plant material has led to widespread movement of plant ecotypes across regions. As bees and other pollinators are often highly specialized to forage on specific plant species because of associated chemical, phenological, and morphological traits, they provide an ideal taxon for empirically evaluating relationships between plant ecotype and biodiversity support. In 2024, we established a common garden experiment to compare how well local and non-local ecotypes support pollinator communities. We sourced seed from 12 perennial native plant species across 3 ecoregions (Northeast, Southeast, and Midwest) and planted them in 6 replicated gardens in Vermont and New Hampshire. In this talk, we present preliminary results from the first field season, including comparisons of flowering phenology, floral abundance, and pollinator visitation across ecotypes. Our data suggest differences in flowering phenology for southeastern ecotypes relative to local plants, but little divergence for midwestern ecotypes. These phenological shifts are also associated with differences in the composition and richness of pollinators observed visiting flowers. We highlight additional similarities and differences in plant performance and pollinator support and outline plans for continued data collection in 2026.

Sun-PM2-B-2

Teaching Parasite Ecology with Trematodes and Snails

Allison T. Neal (Norwich University, Northfield VT)

Abstract – Trematodes are flatworm parasites with complex life cycles that often include 3 hosts: a vertebrate animal (definitive host where sexual reproduction of the parasite occurs), a snail host (first intermediate host), and often a second intermediate host that vary based on the trematode species, including smaller vertebrate animals (e.g., fish/frogs), invertebrates animals (e.g., insects/crustaceans), and plants (more a vehicle than a host). The portion of the trematode life cycle that occurs in snails presents a wonderful opportunity for students interact with live parasites because snails are easy and safe to handle, plentiful in a variety of aquatic environments, and can provide a source of live parasites that does not require handling feces or killing host organisms (rare in parasitology!). I have incorporated my research on trematode parasites in their snail hosts into course-based undergraduate research experiences (CUREs) in my Ecological Parasitology course for several years. Students collect snails from local ponds or wetlands and screen live snails for trematode infection using a dissecting microscope. Infected snails can then be used to answer a variety of ecological questions. Two we have explored are: (1) do trematode colonies have soldiers and queens? and (2) are any snail-inhabiting bacterial species associated with trematode infection? Many other research topics are possible, including trematode taxonomic diversity, host specificity, distribution among hosts, larval behavior (e.g., taxis), inter- or intraspecific interactions within the snail, etc.

Sun-PM2-F-3

Gains From Measuring Fruit Loss

Joshua H. Ness (Skidmore College, Saratoga Springs, NY), Julia Gianattasio (Skidmore College, Saratoga Springs, NY), and L. Rodriguez (Skidmore College, Saratoga Springs, NY)

Abstract - As a biology teacher, I'm interested in creating/supporting/sustaining projects that help students appreciate how plant–animal interactions vary based on (1) the identities of the species involved and (2) landscape composition. I also want projects that encourage both a "naturalist's eye"—whereby repeated observations of natural phenomenon within a season and across years could create a richer, more balanced sense of how they work—as well as a quantitative element such that students could model the dynamics (including the parts of the dynamics they are not seeing). The loss of fruits by plants during autumn and winter is a good fit for both goals. In the period between autumn 2007 to spring 2026, we've monitored fruit loss from 27 plant species (average # of spp per year = 11, average number of years inspected for a given species = 5), and have used relatively simple logistic modeling to describe the timing and pacing of fruit removal and contrast various years. For example, cherries are typically removed early and quickly, while loss of *Euonymus alatus* (Burning Bush) fruits are late-and-slow, and autumn 2020 had fruit-loss dynamics inconsistent with that seen in other years. We've also contrasted the pacing of fruit loss in natural environments to that observed for the same species embedded within the built on-campus environment (finding among-habitat differences for fruit loss by *Cornus amomum* [Silky Dogwood], *Cornus sericea* [Red-osier Dogwood], and *Viburnum acerifolium* [Mapleleaf Viburnum]) and deployed wildlife cameras to monitor fruit removal of species such as *Maianthemum racemosum* (False Solomon's Seal) and *Panax quinquefolius* (American Ginseng). Much of these kinds of projects are flexible, recursive, and open-ended, and amenable to being linked to other locations and time periods.

Sun-PM2-F-4

Spotted Turtle Habitat Use and Cranberry Bog Restoration: Using Wildlife Data to Inform Wetland Restoration Design on Nantucket Island, MA

Danielle O'Dell (Nantucket Conservation Foundation, Nantucket, MA)

Abstract - The Nantucket Conservation Foundation (NCF), Mass. Division of Ecological Restoration's Cranberry Bog Program (Mass. DER) and Fuss & O'Neill environmental engineers implemented a wetland restoration plan for NCF's Windswept Bog property on Nantucket Island, MA, which was retired from cranberry cultivation in 2018. Construction began in January 2024 and took place over a 2-year period, with active restoration work occurring during the winter dormant season (November–March) to avoid impacts to an existing *Clemmys guttata* (Spotted Turtle) population. This project set a trajectory for recovery of ~16 ha (~40 ac) of retired cranberry bogs to diverse wetland communities that preserve and enhance habitat for wildlife species, provide for eventual marsh migration, and improve coastal resilience in the northeastern portion of the island. Extensive pre-restoration research to gain understanding of site conditions and presence of rare plant and animal species on the property was undertaken prior to developing the wetland-restoration design. In particular, we trapped and radio-tracked Spotted Turtles between 2019 and 2025 to determine population size, demographics, and habitat use patterns, especially in regard to the location of hibernation sites. The results of this research and monitoring informed project construction and implementation plans and the development of a detailed Habitat Management Plan aimed at improving and enhancing rare species habitat at the Windswept Bog site. Additionally, this data serves as an important baseline for determining post-restoration success in meeting our ecological goals. This work underscores the importance of gaining a thorough understanding of existing site conditions and wildlife species habitat use prior to initiating large-scale ecological restoration work.

Sun-AM1-D-1

The Maine Master Naturalist Program as a Model for Building Capacity for Nature Education

Sarah O'Malley (Maine Maritime Academy, Castine, ME, and Maine Master Naturalist Program)

Abstract - The Maine Master Naturalist Program (MMNP) was launched in 2012 with the mission to build a critical mass of naturalists willing to volunteer to provide nature education throughout the state of Maine. Training courses are 10 months long and the program runs 1-2 courses a year with 15-24 students in each. Since its inception, MMNP has graduated >280 students from communities across the state. The curriculum includes geology, trees, ferns and flowering plants, fungi, aquatic ecology, birds, and mammals of Maine, as well as preparation for volunteering for community organizations. Mission impact is assessed through voluntary self reporting of programming hours. Current strategic initiatives are to bring courses to more remote regions of the state, develop a hybrid course model (partially remote), and to increase demographic diversity in the student population.

Sat-PM2-A-5

Tidal Impingement and Vegetation Distribution in a Roadside Fringing Salt Marsh System

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

Abstract - In advance of the removal of a failing undersized culvert (location Mill Creek, Penobscot, ME), we surveyed the vegetative communities and collected physical parameters upstream and downstream of the road crossing. We collected marsh surface elevation, stream channel, and vegetation data during a survey period in July 2025. We measured water level, temperature, and salinity continuously throughout the field season (May–October). We determined the upstream vegetative community to be strongly terrestrial in taxonomic make up, despite daily exposure to marine water. Vegetation downstream (seaward) of the culvert more closely reflected expected salt marsh community make up (while only being 10 m or less distant from upstream communities). We hypothesize that the impingement effect of the small culvert, while allowing marine water to infiltrate the upstream marsh, prevents full marine inundation, reducing the salinity stress and allowing terrestrial taxa to dominate. The interplay of fresh and marine water in this system was further illustrated by the incidental observation of numerous *Lithobates clamitans* (Green Frog) both up and downstream of the culvert.

Sat-AM2-B-2

Keeping Grounded: How Data from Scales and Filaments from Eastern North American Reptile Tracks are Key to the Protofeathered Ancestral State of Dinosaurs and Pterosaurs

Paul E. Olsen (Earth and Environmental Sciences, Columbia University, Palisades, NY), Bennett B. Slibeck (Earth and Environmental Sciences, Columbia University, Palisades, NY), and Nicholas G. McDonald (Olde Geology Books, Pawcatuck, CT)

Abstract - Filamentous body coverings (protofeathers) and pebbly foot scales appear early in the history of dinosaurs and their close relatives pterosaurs, suggesting they already combined feathery insulation with robust, bird-like foot integument. Eastern North American, Triassic and Early Jurassic footprints provide key evidence, along with dinosaurs and pterosaurs preserved soft tissue. The Early Jurassic ornithischian ichnogenus *Anomoepus* has pebbly foot scales and tail filament traces, placing these traits near the base of the dinosaurs. Comparisons with Triassic silesaur tracks (*Atreipus*) and pseudosuchian (chirotheroid) tracks indicate that this pebbly scale pattern originated before dinosaurs and pterosaurs diverged, inherited from a common archosaur ancestor. This evidence conflicts with the idea that dinosaur and bird-foot scales are modified feathers, which would require feathers to originate very early within Archosauria. More straightforward is the interpretation that these scales derive from ancestral reptile scales. From this shared starting point, different archosaur groups elaborated distinct integument patterns. Late Triassic and Early Jurassic crocodyliform tracks (*Batrachopus*) retain the chirotheroid pebbly pattern, contrasting with the coarse scales of living crocodyliforms and the angular scales of the Triassic phytosaur track *Apatopus*, plausibly reflecting independent semi-aquatic lifestyle adaptations. Early sauropodomorphs that produced *Otozoum* tracks have large, polygonal pedal scales matching the skin texture of later sauropod giants. Statistical models reconstructing a purely scaly ancestral condition for avemetatarsalians emphasize the absence of filaments in many giant dinosaurs, yet their great size and heat balance would favor reduction of insulation. Some large forms—especially sauropods and hadrosaurs—may have retained filament homologues fused into broad "median feature scales", and with a fibrous internal texture reminiscent of keratinized tubules in rhinoceros horn. Newly reported integument of a small iguanodontid also reveals spike- or quill-like protuberances that may have served for insulation and protection. If further work supports these observations, dinosaur groups such as sauropodomorphs, hadrosaurians, and iguanodontians should be recoded as possessing reduced filaments rather than purely scaly skin, overturning current models and highlighting filamentous coverings as a key innovation for surviving cold, high-latitude climates and repeated volcanic winters, and thus critical to their success.

Sat-PM1-F-2

Beyond the Database: Machine Learning for Trait Extraction from Digitized Herbarium Specimens

Oluwatobi A. Oso (Yale University, New haven, CT) and Erika J. Edwards (Yale University, New haven, CT)

Abstract - Large-scale herbarium digitization has created unprecedented opportunities for botanical research, yet extracting trait data from millions of specimen images remains a bottleneck. We developed an automated machine learning pipeline to extract leaf-margin traits from digitized herbarium specimens, analyzing over 150,000 woody angiosperm species using images sourced from iDigBio. Our convolutional neural network, trained via Roboflow, classifies leaf margins into binary categories (entire vs. non-entire) with high accuracy. The fully automated pipeline integrates leaf identification, margin classification, metadata filtering, georeferencing, and reproducible trait assignment, enabling high-throughput data generation from herbarium collections. Our dataset significantly expands margin-trait coverage beyond existing databases (e.g., TRY, GIFT), particularly for underrepresented taxa and geographic regions. Applying this dataset to global-scale analyses, we confirmed the higher prevalence of entire margins in tropical regions and non-entire margins in temperate zones, and identified the predominance of specific margin types within particular evolutionary lineages. This approach demonstrates how digitized herbarium specimens can be transformed into scalable sources of trait data, enabling new research into trait evolution, climate adaptation, and biodiversity patterns worldwide.

Sat-AM1-C-4

Antioch's Outdoor Classrooms: Creating Opportunities for Experiential Learning

Peter A. Palmiotto (Antioch University, Keene, NH), Suzanne Green (Antioch University, Keene, NH), and Libby McCann (Antioch University, Keene, NH)

Abstract - "Experiential" has perhaps become the buzz word to describe meaningful and tangible learning. What is experiential learning? And how can well-designed outdoor classrooms create the opportunities that provide direct, tangible lessons and experiences for students? The infrastructure built at Antioch University's outdoor properties create opportunities for such learning. In this talk, we will share the design elements that comprise our outdoor classrooms (i.e., natural communities, water, shelter, gathering and reflective spaces, lesson-generating infrastructure, and instructor facilitation) and how they allow natural history and broader-scale environmental topics (e.g., food security, climate change) to be discussed, embraced, and resonate with students and the public.

Sat-PM2-F-2

The Local Herbarium of the Torrey Botanical Club and the Value of Regional Collections

Lydia Paradiso (Cornell University, Ithaca, NY)

Abstract - In 1870, a group of New York City botanists established a local herbarium just a block from the future site of the Empire State Building to aid in their efforts to catalog the regional flora. Over the next century, the Local Herbarium of the Torrey Botanical Club grew to ~100,000 specimens collected in 61 counties across New York, New Jersey, Connecticut, and Pennsylvania by a diverse network of professional and amateur botanists. The collection was moved to the New York Botanical Garden in 1901, where it remained a separate regional reference until the early 1970s, when it was integrated into the general collection. This talk will trace the herbarium's history, highlight notable collectors and collections, and reflect on how herbarium curation shapes place-based research.

Sun-PM2-C-1

The Physiological Effects of *Reynoutria japonica* (Japanese Knotweed) Root Material in *Zophobas morio* (Superworm)

Abby Parker (University of Southern Maine, Gorham, ME) and Joseph K. Staples (University of Southern Maine, Gorham, ME)

Abstract - *Reynoutria japonica* (Japanese Knotweed) is a common invasive plant in New England. This plant thrives as an invasive due in part to low herbivory by native species, which is likely the result of chemically mediated defenses, including emodin and resveratrol. In this study, we examine the metabolic costs of herbivorous insects consuming knotweed-derived compounds by measuring respiratory quotient (RQ; CO_2 production/O_2 consumption) in *Zophobas morio* (Superworm) (Coleoptera: Tenebrionidae) larvae. Respiratory measurements followed a 24-h exposure to wheat-flour diets treated with knotweed root extract, commercial knotweed powder, purified emodin (60 mg g^{-1}), or resveratrol (120 mg g^{-1}). RQ differed significantly among treatments. The emodin treatment produced the largest increase relative to controls, thereby indicating a shift from lipid-based metabolic substrate to carbohydrate utilization or lipogenesis. This trend is seen in organisms under metabolic stress. Based on our results and related published studies, we suggest that in dense stands of Japanese Knotweed and other chemically defended invasive plants, metabolically costly responses may not only reduce individual insect performance but may also scale up to influence insect populations and the ecosystem functions they support.

Sun-PM2-A-3

Poetry and Nature: Another Way to Research

Scudder H. Parker (Natural Voice, Middlesex, VT)

Abstract - I've written poetry throughout my life, always informed by my rural Vermont childhood, love of this land and people, and an enduring astonishment at the miraculous natural order that creates and sustains us. *Safe as Lightning*, released in June, 2020, by Rootstock Publishing, was my first published volume. It was awarded the Best Poetry Book of 2020 by the Independent Publishers of New England (IPNE). My second volume *The Poem of the World*, published by Kelsay Books, was released in April of 2025. My Substack account, Natural Voice is available to everyone for free. It is at Substack.com/@scudderparker. I've had numerous careers—preacher, organizer, gardener, politician, energy consultant, poet—and I am still learning from each of them. Family, farming, failing, finding. Foraging for the innocent sacred, patient in our midst. I try to relinquish the conclusions I was taught to seize and cling to, and learn from the details I've overlooked. It's both scary and joyful. Increasingly, poetry becomes a search for truthfulness—not familiar, quick, or clever decisions. (Doesn't that sound like good scientific practice?) I love writing into a stubborn snarl, then sitting, imagining, open to what comes, what reveals itself. Poetry becomes exploration … and something responds—fit of bone in socket; bees dancing and making music in oregano blossoms; ache of old injustice summoning an opened heart; the strange joy of longing; laughter at long-defended foolishness. In the workshop, I'll present 4 or 5 poems, offering background about their evolution as poems and how that process has also been a journey of spiritual learning.

Sat-AM2-F-1

Full Annual Cycle Movements of Great Black-backed Gulls and Drivers of Offshore Foraging Activity

Peter W.C. Paton (Univ of Rhode Island, Kingston, RI) and Juliet S. Lamb (The Nature Conservancy, Cold Spring Harbor, NY)

Abstract - *Larus marinus* (Great Black-backed Gull) are widespread but declining throughout most of their North American and European ranges. The one exception is along the US mid-Atlantic, where the breeding population has increased recently. To date, individual tracking has mostly been restricted to the breeding season, resulting in limited understanding of individual migratory patterns or habitat associations during the non-breeding period. From 2024 to 2025, we tracked 30 adult Great Black-backed Gulls breeding on Block Island, RI, and near Fisher Island, NY, throughout their annual cycle using GPS transmitters that uploaded data to the 4G cell-phone network. The population was partially migratory, with females and individuals from Block Island more likely to migrate away from their breeding home ranges during the non-breeding season. Migrants dispersed as far as 850 km from their breeding colony, occupying winter sites as far south as Pamlico Sound, VA, and north past Bar Harbor, ME. From December to March, foraging activity shifted from coastal areas occupied during the breeding and post-breeding periods (~15–20 km offshore) to offshore marine habitats up to the shelf break (~200 km offshore). These offshore trips appeared to be closely associated with fishing-vessel activity. Our results improve understanding of partial migration, offshore distribution, and year-round resource use of Great Black-backed Gulls in an increasingly important segment of the species' range.

Sat-AM1-B-3

All Over the Map: Using GPS Tracking and Stable Isotopes to Study Foraging Ecology of Herring Gulls

Autumn Pauly (College of the Atlantic, Bar Harbor, ME) and John Anderson (College of the Atlantic, Bar Harbor, ME)

Abstract - We investigated spatial use and evidence for resource partitioning in breeding *Larus smithsonianus* (Herring Gull) populations of midcoastal Maine by integrating GPS tracking and stable isotope analysis. We deployed 21 GPS tags on adult gulls from 4 colonies in eastern Maine to quantify spatial partitioning within and between colonies during the breeding season and to quantify overlap in space usage using kernel density estimates. To examine trophic specialization on a colony level, we are analyzing $\delta^{13}C$ and $\delta^{15}N$ values from red blood cell samples from gulls within a single colony to assess dietary differentiation among individuals to test for clustering of isotopic signatures within the colony. This approach will allow us to evaluate whether individuals within the colony share similar trophic niches, despite the species' reputation as being a dietary generalist. By combining movement ecology and stable isotope methods, we hope to improve the understanding of how spatial behavior and trophic specialization interact to structure resource use in a highly adaptable seabird.

Sat-AM1-B-4

Bee Microsurveys on Martha's Vineyard

Matt Pelikan (Biodiversityworks, Vineyard Haven, MA)

Abstract - I present the results of muti-year bee surveys from 2 small sites on Martha's Vineyard island, MA: a 0.10-ha (0.25-ac) residential lot in Oak Bluffs and a1.0-ha (2.5-ac) wooded residential parcel in Vineyard Haven. Circumstances have allowed frequent surveys for bees at both sites over a period of years. While both sites feature some measures to improve invertebrate habitat, both see intensive human use and are in developed areas with impaired ecological conditions. Yet at both sites, survey efforts have shown unexpected bee diversity, including locally scarce species. I will describe the 2 sites, summarize survey activity and results, and discuss the implications for bee conservation on Martha's Vineyard and beyond.

Sun-AM2-B-2

Where the Wildlands Aren't: Using Ecological Representation to Secure the Full Diversity of Nature in the Northeast

Shelby Perry (Northeast Wilderness Trust, Montpelier, VT), **Robert Zaino** (Vermont Fish and Wildlife Department, Montpelier, VT), Elizabeth Thompson (Wildlands, Woodlands, Farmlands & Communities, Montpelier, VT), Brian Hall (Wildlands, Woodlands, Farmlands & Communities, Petersham, MA), and Jason Mazurowski (Northeast Wilderness Trust, Montpelier, VT)

Abstract - We assessed the distribution of wildlands across New England and New York to identify critical gaps in ecological representation and direct conservation action. Wildlands are tracts of any size and current condition, permanently protected from development, and in which management is explicitly intended to allow natural processes to prevail with "free will" and minimal human interference. Currently, 5.9% of this 7-state region is protected as wildland. We expected to find that wildlands are not well distributed across the region. To quantify this, we assessed ecological representation within wildlands at 2 scales: the ecoregional scale and the natural community scale. Our results tell a dramatic story. Wildlands are poorly distributed across ecoregions, and located almost entirely within mountainous areas. Wildlands are not representative of the region's natural communities. Indeed, the region's second most abundant and widespread natural community, which covers millions of acres, has scant representation in wildlands. Broadly, most natural communities are underrepresented in wildlands in most ecoregions. However, even within ecoregions with substantial wildland conservation, we found that some common and abundant natural communities are still poorly represented in current wildlands. To help practitioners identify new wildland conservation opportunities, and enhance ecological representation within wildlands, we introduce a new web-based mapping tool that shows these underrepresented natural communities, and the most intact and connected places they occur within each ecoregion. We hope this map will contribute to thoughtful and strategic conservation of wildlands throughout the region.

Sat-PM2-D-5

Introducing the Wildlands Research and Ecology Network (WREN)

Shelby Perry (Wildlands Ecology Director, Northeast Wilderness Trust, Montpelier, VT)

Abstract - The conservation sector has long been heavily influenced by resource management (e.g., forestry), which is well-funded, well-researched, and supported by a deep bench of trained professionals. The distinct and complementary science of wildlands ecology—the study of forests free from management by humans—is chronically understaffed, underfunded, and inaccessible to the people who need it most: land trusts, town conservation commissions, and private landowners. In this presentation, I will discuss the 3-phase approach the Wildlands Research and Ecology Network (WREN) is taking to build an ecological foundation for conservation practitioners across New England and New York. I will specifically focus on the Forest Ecology Small Grants Program, a pilot launched in early 2026 that will provide $10,000 grants for applied research on unmanaged and recovering forests. The program supports diverse research topics, such as forest-recovery trajectories and biodiversity responses to wilderness protection (plants, wildlife, fungi, invertebrates, etc.). We will require our grantees to produce both technical reports and narrative-driven stories to help the public and decision-makers connect with the ecological value of wild places. Over time, we aim to cultivate a wildlands researcher and communicator network, making this research available to those who need it most.

Sat-PM2-D-4

Biodiversity and Climate Resiliency: The Rise of the Fruiting and Vine Plants and Their Associated Tri- Trophic Insect Interactions

Anand B. Persad (Tetra Energy Sciences, Gainesville FL)

Abstract - I studied biodiversity analyses and pant components in relation to invertebrate interactions in rights of way's (ROWs) in the Northeast US from 2021 to 2024. I sampled all sites for plant, invertebrate, and avian biodiversity in ground and optical surveys following new construction, removal of invasive plant species, weather-related events, and/ or major vegetation initiatives for the purpose of removal of non-compatible trees and woody plants. Inherent plant characteristics are important in climate-focused greening and vegetation management initiatives and are becoming increasingly relevant in response to weather effects, wildlife habitat enhancement, and plant succession. The data indicates that plant and invertebrate dynamics are complex, with habitat use by invertebrates and birds exhibiting defined foraging windows. In an ever-changing climate, long-term plant dynamics and succession are important to understand as we practice vegetation management. Plants display broad community structure, and 1 or more species may become dominant in local situations. Fruiting and vining plants emerge in dominance. I tracked insects in the order Hymenoptera, Lepidoptera, and others observed on these plants and present incident levels of plant herbivory and tri-trophic interactions using insects as models. These trends may continue to develop and will influence our vegetation management and land stewardship initiatives, especially as we program pollinator initiatives.

Sat-AM1-F-2

Assessing Potential Carnivory in *Triantha glutinosa*

Lindsey A. Pett (Norwich University, Northfield, VT)

Abstract - I sampled 75 flowering individuals of *Triantha glutinosa* (Sticky False Asphodel) across 3 calcareous seep wetlands in Vermont to evaluate morphological variation and assess preliminary evidence of carnivory. Stem length and fruiting head length differed significantly among sites and were positively correlated, while stem diameter and leaf number showed no site-level differences. Prey capture rates were low and consisted primarily of small dipterans and aphids, with no detectable relationship between plant morphology and prey capture. In addition to capturing invertebrates, adhesive stems served as attachment sites for juvenile spiders and accumulated sediment and seeds, indicating broader ecological interactions. Results suggest that Sticky False Asphodel may exhibit weak or incipient carnivory, though enzyme activity and nutrient assimilation remain untested. This study provides a foundation for future work assessing whether adhesive stems in Sticky False Asphodel function primarily in carnivory, facilitation of mutualists, or a combination of both.

Sat-AM1-F-4

Eco Essays: Big Ideas from Little Things in Nature

Bryan Pfeiffer (Chasing Nature, VT)

Abstract - From a seed in the woods to words on a page to the expanse of the human mind—this is an eco-writer's odyssey. I'll navigate one route for us with a few waypoints: be in nature, think in nature, think some more, draft, revise, go for a walk, revise, and revise yet again. And this is to say nothing of the lede, which is at least half the work because without a lede you are lost. So, in only 20 minutes I'll give you a writing method that took me 40 years to understand (and which is still in revision). I am a naturalist, educator, and writer whose articles and essays have appeared in Orion, Aeon, The New York Times, The Boston Globe, Northern Woodlands, Field & Stream, and many other places. A former writing instructor in the Field Naturalist Program at the University of Vermont, I have also taught Eagle Hill seminars on birds, dragonflies, and butterflies. My latest passion seems to be botany. I now write essays (and occasional poetry) on wildlife, wild places, and the human condition at my Substack titled Chasing Nature (chasingnature.substack.com).

Sat-AM2-F-3

The Effects of Cohabitation on Growth of Eastern Box Turtle Head-Starts

Nora Platt (Bristol County Agricultural High School, Dighton, MA) and **Victoria Welzel** (Bristol County Agricultural High School, Dighton, MA)

Abstract - *Terrapene carolina carolina* (Eastern Box Turtle) populations are declining due to habitat fragmentation, road mortalities, and illegal pet trade. "Head-starting" is used to raise hatchlings in captivity beyond their most vulnerable life stage to augment declining populations. We tested multi-species cohabitation and "sibling" group cohabitation in Eastern Box Turtle head-starts. Group 1 (n = 4) was comprised of 2 Eastern Box Turtles and 2 *Glyptemys insculpta* (Wood Turtle). Group 2 (n = 4) was comprised entirely of Eastern Box Turtles (i.e., "siblings"). Group 3 (n = 5) was Eastern Box Turtles hatched from a single clutch (i.e., "siblings"). Group 4 (n = 4) was Eastern Box Turtles from 2 different clutches (i.e., "non-siblings"). Captive management for all head-started turtles was identical. We collected both weight and straight carapace length (SCL) approximately every 2 weeks between 6 December 2024 and 23 May 2025. The Eastern Box Turtles housed with Wood Turtles (Group 1) exhibited a weight increase of 352.96% and an SCL increase of 64.53%. The Eastern Box Turtles housed only with conspecifics (Groups 2, 3, 4) exhibited weight increases of 310.72%, 335.17%, and 394.53%, and SCL increases of 61.98%, 66.82%, and 67.69%, respectively. The Eastern Box Turtles housed with only "siblings" (Groups 2, 3) exhibited weight increases of 310.72% and 335.17%, and an SCL increase of 61.98% and 66.82%, respectively. The Eastern Box Turtles housed with "non-siblings" (Group 4) exhibited a weight increase of 394.53% and an SCL increase of 67.69%. The Eastern Box Turtles housed with Wood Turtles (Group 1) exhibited mean weight and SCL growth similar to the conspecific groups (Groups 2, 3, 4). The "non-sibling" group of Eastern Box Turtle head-starts (Group 4) exhibited greater growth in both weight and SCL, but also had the greatest variation among individuals (i.e., greatest range) compared to the "sibling" groups (Groups 2, 3). These results may offer options that increase efficiency in using resources for operating conservation facilities with head-starting programs. Animals from different species may be housed together as long as biosecurity is not compromised and the environmental requirements for both species are similar. However, some species may exhibit increased growth (weight and SCL) when housed in groups hatched from a single clutch (i.e., "siblings"). With only 15 total Eastern Box Turtle hatchlings used in this study, replication studies including a larger sample size and a longer study period would allow for more robust statistical analysis to determine any significance.

Sat-PM1-A-2

Fired Up: Quantifying Fire Severity of Prescribed Burns Across Temporal and Spatial Scales

Amélie Przedwiecki (Center for Earth and Environmental Science, SUNY Plattsburgh, Plattsburgh, NY), Neil Gifford (Albany Pine Bush Preserve Commission, Albany, NY), Stephen Campbell (Albany Pine Bush Preserve Commission, Albany, NY), Tyler Briggs (Albany Pine Bush Preserve Commission, Albany, NY), Mark Baran (Center for Earth and Environmental Science, SUNY Plattsburgh, Plattsburgh, NY), and Mark Lesser (Center for Earth and Environmental Science, SUNY Plattsburgh, Plattsburgh, NY)

Abstract - Many ecosystems are adapted for wildland fire as a disturbance process shaping habitat structure, composition, and function. Wildland fire can increase light penetration to the understory, facilitate nutrient cycling, reduce fuel loads, reduce litter and duff, and expose mineral soil, all of which can alter/maintain wildlife and vegetation dynamics. Prescribed fire is a tool to achieve specific management goals in fire-adapted ecosystems. However, using fire to achieve specific objectives can be unpredictable due to the large number of factors influencing fire effects. Fire severity describes the biological effects of fire based on seasonal timing, fuel, topography, and weather conditions. Prescribed fire has had limited use in the Northeast and has rarely been quantitatively assessed. Our objective was to create a quantitative measure of fire severity using a composite burn index (CBI) based on pre- and post-burn data. The Albany Pine Bush Preserve Commission has been implementing prescribed burns since 1991, and have been collecting pre- and post-burn severity data since 2022. Data were collected within 60 burn units, varying from 0.05 to 19 ha. Within each burn unit, we randomly placed circular plots (10 m radius), with the number of plots weighted by unit size. Data consisted of litter and duff reduction, percent exposed mineral soil, shrub/sapling top-kill, and tree scorch and char heights, which we used to calculate plot level CBI within each burn unit on a scale of 0 (unburned) to 3 (high severity). We found high levels of variance between burn units, but also between plots within burn units, suggesting that fire severity can change across small spatial scales. Spatial analysis will allow us to determine how fine-scale topography (slope, aspect, elevation, and topographic convergence index) influences fire severity. While current research indicates a 3-to-20 year interval is appropriate to maintain a *Pinus rigida* (Pitch Pine)–*Quercus ilicifolia* (Scrub Oak) barrens, this research will further our understanding of how differing fire severities interact with burn intervals and season to achieve restoration and/or maintenance management outcomes. Finally, continuing to collect these data will allow us to assess the impact of repeated burning on fire severity, and modify management actions as appropriate.

Sat-PM2-D-3

SUNY ESF's Quad Meadow: A Novel Ecosystem for Biodiversity Research and Education

Samuel Quinn (SUNY ESF Restoration Science Center, Syracuse, NY), Molly Jacobson (SUNY ESF, Syracuse, NY), Elise Calahan (SUNY ESF, Syracuse, NY), and Donald J. Leopold (SUNY ESF, Syracuse, NY)

Abstract - In June of 2024, SUNY ESF converted part of its campus quad to a botanically diverse meadow. The goal was to create an attractive landscape feature that all departments could use for research and education. The meadow is not based on a reference plant community but is a novel assemblage of herbaceous species, some of which are not native to upstate New York but provide specific biodiversity and ecological benefits we have prioritized. The site has a good variety of light levels, soil thickness, and moisture regimes supporting distinct patterns of plant distribution post-seeding and allowing us to establish a diversity of upland and wetland plants, including NY Natural Heritage Program S1 species. Our aim is not to restore to any past state but to design for the future. We manage a suite of ongoing monitoring efforts to track changes in soil chemistry, bird and pollinator use, and shifts in soil biological communities and plant distributions following the creation of the meadow. The site now supports over 170 documented plant species and is used by a variety of classes for coursework ranging from Conservation and Plant Biology to Restoration Ecology to Landscape Architecture. This long-term project will allow us to assess the effects of this novel plant community on a variety of ecological interactions and create numerous opportunities for student engagement. We will discuss the process of creating and managing this campus resource, its research and education products to date, and some of the challenges of stewarding SUNY ESF's campus meadow.

Sat-PM2-F-3

Sex-biased Dispersal Patterns in *Plethodon cinereus*

Julianna Rakowski (Randolph-Macon College, University of Richmond - SPARCnet RaMP), Stephanie Coster (Randolph-Macon College, Ashland, VA), and Caitlin Fisher-Reid (Bridgewater State University, Bridgewater, MA)

Abstract - There are 2 main hypotheses related to the existence of sex-biased dispersal: (1) resource competition leads to female dispersal in birds, and (2) competition for mates leads to male dispersal in mammals. *Plethodon cinereus* (Eastern Red-backed Salamander) has been shown to participate in both mate defense and social monogamy, which would indicate different sex-biased dispersal patterns. Previous research has provided conflicting results on whether or not the dispersal of Eastern Red-backed Salamanders is sex-biased. Of the 3 published studies that looked into this phenomena, 2 occurred in Pembroke,VA, and had conflicting results, with one indicating male-biased dispersal and the other indicating no sex-bias. The third study, which occurred in Maryland, also indicated no sex-biased dispersal. It is still unclear whether Eastern Red-backed Salamanders exhibit sex-biased dispersal and if dispersal patterns are standard across their range. By using genetic methods to explore dispersal at 5 different sites across Maryland, Pennsylvania, and Massachusetts, this study explored whether or not Eastern Red-backed Salamanders exhibit the same pattern of sex-biased dispersal across locations, and if so, which sex is the primary disperser. We used 14 microsatellite loci to genotype individuals and then a spatial autocorrelation analysis of relatedness by sex to explore patterns of sex-biased dispersal. By broadening the range and numbers of populations studied, we are closer to understanding general dispersal patterns in Eastern Red-backed Salamanders.

Sat-AM2-D-4

An Unsuspected Tool in Science Education: Conversations about Social Justice in Science Increase Sense of Belonging in Sciences

Gustavo Requena Santos (Sterling College, Craftsbury, VT)

Abstract - Science education commonly misrepresents science as an exclusive group of Caucasian, older, cis-male American professionals, socially isolated geniuses who follow a rigid, single “Scientific Method” until finally making a great discovery that produces “true” knowledge that is ultimately added to a list of facts in a textbook. Despite the increase in diversity in the scientific community and among college students, such widespread misrepresentation impacts what is taught and what is learned in the classroom, dramatically affecting the science identity and sense of belonging of women, people of color, low-income students, and first-generation college students. Such discrepancy has motivated the development of resources that challenge this misleading social construct and spark conversations about social justice and inequities in science. The “Scientist Spotlights” intervention highlights the plurality of trajectories, practices, and values present in science. Its implementation in a multitude of college contexts has attested to consistent positive changes in students' perceptions of scientists and increases in lesson engagement and science identity, particularly among students who may not initially see themselves reflected in STEM fields. In this presentation, I will share resources and my own experience with high-school and college students in introductory courses and in more advanced settings, particularly implementing and co-designing intervention materials that integrate biographical profiles of counter-stereotypical scientists, primary literature, and structured reflection on the socio-cultural aspects of science. Finally, I will advocate that even earlier encounters with science grounded in curiosity, care, and sense of belonging must be encouraged to shape young students’ science identity and lifelong relationship with learning.

Sat-AM2-A-3

Biodiversity Gains in ROW: Importance of Information-Based Programs

Mariclaire Rigby (National Grid, Boston MA) and **Eric George** (National Grid, Boston MA)

Abstract - Biodiversity gains in rights of ways (ROWs) in and around our utility and transportation corridors are increasingly becoming a target goal entrenched in our day-to-day management strategies as we embrace the nuances of change in weather patterns. This presentation describes how a multidisciplinary information-based approach helps with understanding the big picture and delivers on aspects of improving tree-canopy health and tree species richness, enhanced stewardship, biodiversity, and resiliency. The data presented from real world utility ROWs in 3 Northeast states in the US describe new plantings of native tree species in certain high-impact areas, case studies in post-construction plantings, and off-corridor tree enhancement. We also demonstrate that biodiversity can assist in engaging in many of our social deliverables in and around the communities we serve. Furthermore, there is the need for sustainable ideals which can improve the outcome as we aim to reduce input and generate ecologically and economically favorable outcomes. The requirements of better understanding our ROWs from soil to sky and everything in between, has never been more crucial in our integrated vegetation management evolution and will only become more necessary as we brace for more erratic weather systems.

Sat-AM1-F-1

Status and Ecology of Northern Monkshood (*Aconitum noveboracense*) in the Catskill Mountains of New York

Richard M. Ring (NY Natural Heritage Program, Albany, NY)

Abstract - *Aconitum noveboracense* (Northern Monkshood) is a federally threatened wildflower species. It has a presumed glacial relict distribution, and is known only from northeastern Iowa/southwestern Wisconsin, northeastern Ohio, and the Catskill Mountains of New York. We conducted surveys and censuses of all known extant locations for Northern Monkshood in New York. Our results indicate a continued decline in both the extent and abundance of this species in the Catskills. We also found that at least in New York, Northern Monkshood occupies a somewhat broader range of habitats than previously assumed. We suggest that the effects of climate change, represented by both changing temperature and precipitation patterns and more frequent severe stream flooding, may explain Northern Monkshood's decline in New York.

Sat-PM1-C-3

A 14,000-Year Vegetation and Fire History of Nature Study Woods Swamp, Southern New York

Guy Robinson (Fordham University, New York, NY), Elana Torkian (Fordham University, New York, NY), and Alexander Yorke (Sharon Springs High School, Sharon Springs, NY)

Abstract - Using a 6-cm-diameter bucket auger, we extracted a 4.8-m core from a swamp in the City of New Rochelle, NY. Pollen analysis shows the lowermost 4 m of mostly silty material was laid down in the late Pleistocene, forming 3 distinct vegetation zones comparable to the New England Pollen Stratigraphy: a tundra zone overlaid by *Picea* (spruce), followed by the Younger Dryas cold period. Radiocarbon dates taken from plant macrofossils support this interpretation. The uppermost 80 cm comprise post-glacial time with the period following European Contact forming the top 20 cm. Microscopic charcoal-particle analysis indicates fires were frequent when the landscape was mostly tundra, notably with grass charcoal reaching its highest levels at this time. Fungal spores associated with the dung of large animals are most abundant during the same period. At about 13,000 radiocarbon years before present, as the landscape became dominated by spruce, fire was less frequent and the spores declined. Unlike many other sites in the region, it appears that here, large animals were abundant early, at the same time that fires were frequent. As the landscape became more wooded, and the climate warmed, large animals became scarce and fires less frequent. To explain this paradox, we propose that human foragers arrived in the earlier period, using fire and hunting megafauna, then moved on as those prey animals became rare.

Sat-PM1-F-4

Digitization of the SUNY Oneonta Herbarium and Establishing a SUNY Herbarium Network

Sean C. Robinson (SUNY Oneonta, Oneonta, NY)

Abstract - Herbaria, collections of preserved plants, are valuable sources of data essential to studies in the biological sciences. In particular, small local herbaria play a critical role in the study of regional biodiversity. The Jewell and Arline Moss Settle Herbarium at SUNY Oneonta (SUCO) currently contains over 15,000 specimens including algae, bryophytes, lycophytes, ferns, gymnosperms, angiosperms, and fungi. Since August of 2016, a team of undergraduate Assistant Curators have been databasing and imaging the SUCO collections and making them accessible via open-access data portals. In an effort to network with other SUNY herbaria and help facilitate the digitization of their collections, SUNY Oneonta hosted a SUNY Herbarium Workshop in the summer of 2018. Fifteen herbarium curators from 13 SUNY institutions were in attendance. In addition to sharing information regarding all aspects of herbarium curation, the goal of this workshop was to discuss strategies for building community and developing future collaborations between small regional herbaria across New York State.

Sun-PM2-C-5

Effect of *Reynoutria spp*. (Knotweeds) on Plant Succession in Riparian Areas

Stephen M. Root (SUNY Onenota, Oneonta, NY) and Miranda Kearney (SUNY Onenota, Oneonta, NY)

Abstract - Riparian forests provide critical ecosystem services, including stream-bank stabilization, water filtration, and support for biodiversity. However, the invasion of *Reynoutria japonica* (Japanese Knotweed) and related species poses a threat to these ecosystems by altering plant-community composition and reducing structural stability. This study investigates the effects of knotweed invasion on plant succession in riparian forests within the Susquehanna River watershed in Otsego County, NY. We conducted plant community surveys in knotweed-invaded and uninvaded riparian plots at 3 study sites to assess species richness and diversity. Additionally, a planting experiment was conducted to evaluate the establishment and growth of 3 native riparian species (*Parthenocissus quinquefolia* [Virginia Creeper], *Cornus sericea* [Red-osier Dogwood], and *Pinus strobus* [White Pine]) within invaded and uninvaded plots, with and without bio-char amendment to assess potential allelopathic effects. This research aims to enhance our understanding of native plant persistence and potential restoration strategies in knotweed-invaded habitats. Findings will inform management practices by evaluating the feasibility of direct planting as a restoration approach in riparian ecosystems impacted by invasive species.

Sun-PM2-A-4

Habitat Selection and Colony Attendance of Alcids on Great Duck Island, Maine

Ezra L. Rowe (Island Research Center, College of the Atlantic, Bar Harbor, ME)

Abstract - I studied habitat selection and colony attendance of alcid populations on Great Duck Island, ME (44°09′N, 68°15′W). The shoreline provides innumerable potential nest cavities for a population of >169 pairs of *Cepphus grylle* (Black Guillemot) and an emerging colony of *Fratercula arctica* (Atlantic Puffin). A total of 49.7% (84/169) of Black Guillemot nests and 100% of Atlantic Puffin nesting area occurred within *Larus* spp. gull colonies. Black Guillemot attendance peaked at dawn (~04:30 hrs) and was minimal during the afternoon. Black Guillemots harassed by kleptoparasitic gulls exhibited cautious provisioning behaviors such as circuitous flight and synchronized, "swamping" deliveries. Atlantic Puffin attendance was highly synchronous and often bimodal. Courting *Alca torda* (Razorbill) and *Uria aalge* (Common Murre) occurred sporadically in small numbers.

Sat-AM1-B-2

Dam Removal from the Perspective of a Freshwater Mussel

Allison Roy (US Geological Survey, Massachusetts Cooperative Fish and Wildlife Research Unit, Department of Environmental Conservation, University of Massachusetts Amherst, Amherst, MA), Alexa Hershberger (Organismic and Evolutionary Biology Program, Massachusetts Cooperative Fish and Wildlife Research Unit, University of Massachusetts, Amherst, MA), Jason Carmignani (Natural Heritage and Endangered Species Program, Massachusetts Division of Fisheries and Wildlife, Westborough, MA), Peter Hazelton (Warnell School of Forestry and Natural Resources, University of Georgia, Athens, GA), and Ayla Skorupa (Illinois Natural History Survey, University of Illinois at Urbana-Champaign, Champaign, IL)

Abstract - Freshwater mussels (Unionidae) have experienced myriad threats, resulting in global population declines. For many stream-dwelling mussel species, dams can fragment populations by separating suitable habitat and limiting host fish dispersal. While dam removal is considered an important restoration strategy—e.g., facilitating fish movement, reconnecting lotic habitats, restoring sediment dynamics, and improving water quality and temperature—dam removal can also harm freshwater mussels. For example, dam removal can cause mussel mortality in impoundments during rapid dewatering and downstream of dams from sediment deposition. Moreover, many endangered and at-risk mussel species are associated with dams, and potentially rely on the impoundment, downstream flow refuge, and increased algal production from impoundments; thus, the absence of dams can disrupt populations. An understanding of how dam removal can be implemented to minimize harm to rare species can lead to more effective, ecologically beneficial restoration projects. In this talk, we will discuss considerations for (1) selecting sites for dam removal based on freshwater mussel distribution and landscape-scale drivers of mussel presence, (2) translocating mussels from areas expected to be impacted during the dam-removal process, and (3) monitoring responses of freshwater mussels and habitat to dam removal. This information can help inform where and how to remove dams to minimize both short-term and long-term impacts on freshwater mussels, as well as how to best monitor mussel responses to guide ongoing, adaptive management.

Sat-PM2-B-5

Investigating Myco-Phytoremediation while Restoring Degraded Riparian Forested Buffers into Multi-Functional Habitats for Socio-Ecological Reconciliation

Jess Rubin (MycoEvolve, UVM ALE Department) and Josef Gorres (UVM ALE Department, Burlington, VT)

Abstract - A restoration project, based on a previous pilot, tested whether mycorrhizae can improve phosphorus (P) mitigation and pollinator functions of degraded riparian forested buffers (RFBs) on a Vermont farm while facilitating Abenaki access to ancestral lands. Six plots within a degraded RFB were restored with a multi-functional plant community. Three restored plots were inoculated with endemic mycorrhizae (RVM), 3 restored plots were not inoculated (RV), and 3 control plots (OIV) remained in their degraded state, dominated by aggressive nonnative shrub *Rhamnus cathartica* (Buckthorn). The restoration palette consisted of 42 (10 tree, 6 shrub, 16 herbaceous,10 groundcover) species, which were all pollinator hosts and beneficial to Abenaki, offering P-removal opportunities through honorable harvest. While total soil P in restoration treatments were not significantly different, concentrations in the control were significantly higher ($P < 0.001$) than in the restored plots. This pattern, mirrored in both Mehlich III extractable P and water-extractable soluble reactive P data, suggests restoring a degraded riparian buffer with a diverse, multi-synusial palette can mitigate P while providing food and medicine. While there was no statistically significant difference in treatment for plant P uptake, there was for both category and species ($P < 0.001$). Phytoextraction with cyclical harvest has promising implications for reducing P concentrations in runoff and percolate. There were statistically significant differences in plant diversity between the control and restored plots ($P < 0.001$), as expected, but not between restored plots. Within 2 years of restoration, a mean of 54 volunteer species appeared in the restored plots, doubling plant species richness. Design and installation of native, polyculture palettes, non-chemical removal of Buckthorn, and strategically timed harvest of P-accumulating plants maximizes RFB's multi-functional support for trophic resilience and begins socio-ecological reconciliation of colonial agriculture's legacy.

Sat-PM1-D-2

Landscape Distribution of Necrophagous Flies in a Recreationally Used Urban Forest Block in Boston, Massachusetts

Samantha J. Sawyer (University of New Haven, West Haven, CT), Danielle Barrasso (Curry College, Milton, MA), and Sarah Channen (Curry College, Milton, MA)

Abstract - Necrophagous flies are essential to ecosystem function through several services, including pollination, and nutrient recycling. These flies are known to be able to travel far distances, however, geography typically drives metapopulation structure, limiting species to pockets across a landscape. How fly species coexist across a landscape can help establish which species is better poised to utilize resources in that immediate vicinity. It can also establish host–parasite relationships in some species. Massachusetts presents a unique assemblage of forested habitats adjacent to densely populated city blocks, especially in the greater Boston area. The goal of this study is to understand geospatial and temporal variation of necrophagous fly populations in recreationally used hiking trails. Curry College is 11 km from downtown Boston, and exists adjacent to the Blue Hills Reservation, a ~2800-ha protected state park, connecting it to the ~250-ha Neponset River Reservation through a protected wetland area that bisects north and south campus. A ~1.6-km hiking trail traverses the protected land and forested area around college residential buildings. We monitored necrophagous flies along this trail using fly traps baited with cat food and hung ~1.5 m (~5 ft) off the ground during the Fall of 2022. We placed traps across 24 pre-determined locations with at least ~100 m between sampling locations. We kept traps in place for 1 week and sampled each location once every 4 weeks. We identified all flies to family and necrophagous fly families to species, with 10 fly families and 11 necrophagous fly species identified. Spatial means indicate that there is spatial niche partitioning across the landscape, expressing that microhabitats within this habitat are playing a role in species distributions.

Sat-PM2-D-2

The Hidden Heroes of Herbaria: The Collector Practices that Enable Large-scale Floristic Research in the Northeast

Ryan Schmidt-Knapik (Harvard University, Cambridge, MA), Kristen Saban (Harvard University, Cambridge, MA), Lena Struwe (Rutgers University, New Brunswick, NJ), and Charles Davis (Harvard University, Cambridge, MA)

Abstract - Herbaria are invaluable resources for studying global biodiversity. Herbarium specimens are especially important for addressing questions that span large temporal and spatial scales, such as investigating introductions of non-native and invasive species and large-scale floristic change. While spatial, temporal, and taxonomic biases in herbaria affect analyses, the influence of collector practices on biases remains largely unexplored. We utilized one million digitized specimens collected in the northeastern US from 237 herbaria and analyzed contributions from ~10,000 collectors to investigate the similarities and differences between more- and less-prolific collectors and how collector practices influence spatial, temporal, and taxonomic biases in herbaria. We identified 6 common collector practices, or collection norms: collectors generally collected (a) different species, (b) from multiple locations, (c) from sites sampled by others, (d) during the principal growing season, (e) species identifiable outside peak collecting months, and (f) species classified in species-poor families and genera. These collection norms —shaped by both mega collectors and less-prolific collectors—have greatly increased spatial, temporal, and taxonomic coverage in NHCs and have allowed us to study large-scale floristic change in the Northeast. As a case study, I will explore how the collector practices of 19th-century botanists have enabled us to study the impact of historical shipping trade and ballast deposition on the flora of the Northeast.

Sat-AM2-C-1

Quantifying Fine-Scale Movement Patterns of *Plethodon cinereus*

Kristie Semanchik (Monmouth University, West Long Branch, NJ) and Sean Sterrett (Monmouth University, West Long Branch, NJ)

Abstract - Movement patterns of wildlife are influenced by a combination of intrinsic factors (e.g. sex, age) and extrinsic factors (e.g. season, environmental conditions, climate). Most ecological studies analyzing movement focus on large-scale migration events; however, even changes in fine-scale movement and space-use can have cascading ecological effects. For organisms confined to soil environments, those fine-scale movements may include vertical movements to track moisture, temperature, or food sources. *Plethodon cinereus* (Eastern Red-backed Salamander) is a terrestrial salamander with a limited home range, strong site fidelity, and high sensitivity to microhabitat conditions, making it an excellent model organism to understand fine-scale movement and space-use patterns within soil environments. However, their small size (<1–2 g) requires new technologies to understand these movements. We employed a combined approach using passive integrated transponder (PIT) telemetry and high precision GNSS location data to understand how sex jointly interacts with season to shape movement metrics, including home range. Individuals (n = 58; 35 M, 23 F) were monitored using a systematic survey design across 3 field sites during periods of peak survey activity (fall and spring). At each detection location, we took coordinates using a GNSS unit to receive sub-meter positional accuracy integral for quantifying fine-scale movements. In Fall 2025, we detected individuals an average of 2.34 ± 1.79 times, with a mean length of movement of 1.96 ± 2.81 m between successive detections. Results provide novel insight into understanding the spatial extent, movement frequency, and home-range of Eastern Red-backed Salamanders. Through robust monitoring, this study will provide applicable knowledge for understanding movement patterns in organisms with limited home ranges and those that live in soil environments.

Sun-AM2-D-3

From Backlogs to Biodiversity Conservation: Unlocking the Power of Herbaria with AI

Emily B. Sessa (New York Botanical Garden, Bronx, NY), Kim Watson (New York Botanical Garden, Bronx, NY), and William Weaver (University of Michigan, Ann Arbor, MI)

Abstract - Herbarium collections preserve centuries of biodiversity knowledge, yet most specimen data remain inaccessible for research and conservation. At the New York Botanical Garden, we are deploying artificial intelligence tools to accelerate specimen transcription and data extraction, and developing new tools to translate these data into direct conservation impact. This talk presents an integrated view of NYBG's AI-enabled workflows, from computer vision and large language models that scale label transcription and trait measurement to IRIS, a new web-based tool designed to generate Red List–ready outputs directly from herbarium specimens. By aligning AI-derived data with IUCN Red List assessment requirements, IRIS aims to support faster, more transparent conservation evaluations. We emphasize AI as an assistive technology that helps scientists prioritize effort where human expertise is most needed. Together, these approaches demonstrate how targeted, responsible use of AI can transform herbarium backlogs into actionable biodiversity knowledge.

Sat-AM1-C-3

Glow, Baby, Glow: Investigating Biofluorescence in the Eastern Red-backed Salamander (*Plethodon cinereus*)

Shelby J. Shartzer (Mary Baldwin University, Staunton, VA), David Mcleod (Mary Baldwin University, Staunton, VA), and Kadrin Anderson (Mary Baldwin University, Staunton, VA)

Abstract - Biofluorescence, the absorption of short-wavelength light and re-emission at longer wavelengths, is now well documented in amphibians, including salamanders from 8 of 10 recognized families. In *Plethodon cinereus* (Eastern Red-backed Salamander), it has been observed as green, fluorescent serous 1 (S1) glands on the ventral surface of the tail, under blue and UV excitation. Despite this, the chemical composition, ecological significance, and prevalence of this trait remain poorly understood. Using histological and biochemical analysis of the S1 gland, in combination with mark–recapture surveys, we investigated the anatomical basis, chemical origin, and prevalence of biofluorescence in Eastern Red-backed Salamanders. We identified 2 previously undescribed fluorescence patterns within the species: blue fluorescence in similar patterns as green fluorescence within glandular tissue, and orange fluorescence following the characteristic ventral mottled pattern, observed under 365-nm UV excitation. We visualized fluorescence within glands using microscopy and confirmed it as glandular in origin through hematoxylin and eosin staining. Mark–recapture data allowed for the quantification, prevalence, and seasonal variation of biofluorescence at our study site. Together, these findings expand current understanding of salamander biofluorescence and provide a foundation for future studies of its functional and ecological significance.

Sun-AM2-D-2

Rhode Island Pollinator Atlas: Showcase of Rhode Island Bumblebee Survey and Wild Bee Survey Highlights

Toby Shaya (Rhode Island Division of Fish and Wildlife, West Kingston, RI) and Katherine Burns (Rhode Island Division of Fish and Wildlife, West Kingston, RI)

Abstract - From 2022 to 2025, the Rhode Island Division of Fish and Wildlife coordinated a statewide survey to establish the current status of *Bombus* (bumble bees) in Rhode Island. We coordinated work among 46 volunteers surveying at 67 sites across the state, with some additional surveys done by the Pollinator Entomologist. RIBS sites were located in all 5 counties and 37 of Rhode Island's 39 towns. We detected all currently extant species, minus *B. auricomus* (Black and Gold Bumblebee), and documented their floral hosts, distribution, and relative abundance. Additionally, we produced general public outreach material from this work, with background information, methodology, and individual species profiles for all historical and extant species. We also want to highlight work done for the Rhode Island Wild Bee Survey, including notable species finds, volunteer contributions, and summary of species found.

Sun-AM2-B-1

Vermont's Sugaring Operations and Potential Implications for Wildlife

Matthias Sirch (UVM, Burlington, VT)

Abstract - I deployed trail cameras and audio equipment to determine richness of bird and mammal species in response to sugaring infrastructure and forest management within 20 active sugarbushes across Vermont from July-October, 2025. I also compiled a statewide inventory of active sugarbushes primarily using "use-value appraisal" data and explored how these properties intersect with (a) movement needs of 6 of Vermont's larger mammal species and (b) Vermont Conservation Design areas of greatest conservation priority. By integrating site-level habitat data with statewide conservation mapping, I place wildlife observations within a broader landscape context and identify where ecological sugarbush management may have disproportionate importance for maintaining habitat quality and connectivity in Vermont's forests.

Sat-PM1-E-2

Management of Aegopodium podagraria (Goutweed) Using Native Plants at the Intervale's Silver Maple-Ostrich Fern Floodplain Forest

Emma Smith (UVM Plant Biology Department, Burlington, VT)

Abstract - *Aegopodium podagraria* (Goutweed) is an invasive terrestrial plant that poses a significant threat to many ecosystems in North America, and the currently accepted control methods are costly, ecologically disruptive, and often not very effective. We conducted this study in an *Acer saccharinum* (Silver Maple)–*Matteuccia struthiopteris* (Ostrich Fern) floodplain forest ecosystem located at Burlington's Intervale Center along the Winooski River and evaluated the use of native herbaceous plant polycultures as a possible biological control strategy for Goutweed. The treatment plants were chosen for a variety of factors including competitive nature, allelopathic chemicals, and their varied ecological niches. We hypothesized that this treatment would increase biodiversity and encourage coexistence in areas with severe populations of Goutweed. We evenly and randomly assigned 30 plots to 1 of 3 treatments (control, cut, and cut + planted), and monitored the plots over 6 weeks in the summer 2025. Preliminary results demonstrate support of our initial hypothesis. We will continue to monitor the plots over the following growing seasons, and the results of this study will help to inform an adaptive management plan that can be used to further control Goutweed in this ecosystem

Sat-PM1-D-3

Larval Keys to New England Amphibians

Scott Smyers (Oxbow Associates, Inc., Boxborough, MA), Adam Kohl (Oxbow Associates, Inc., Boxborough, MA), and Tigran Tadevosyan (Oxbow Associates, Inc., Boxborough, MA)

Abstract - Many references are available to identify adult frogs and salamanders but few guides exist to discern amphibians' larval stages. The larval guides that exist are either highly technical (requiring specimen collection and microscope use), or focus on regions outside of the northeastern US. Our keys draw on previous publications from within and outside this region, specimen examination, rearing, and years of accumulated field experience. We emphasize and explain observable field characters to reduce the need for collection and microscopic examination. Our new guide intends to expand the conservationist's toolkit for accurately identifying larvae of 11 frogs (anurans) and 11 salamanders (caudates), which is important to detect rare species and identify seasonal wetland/vernal pool habitat important to many amphibians.

Sat-PM1-A-1

Pollinator Pledges: Encouraging Farm Visitors to Take Conservation Action

Leslie C. Spencer (University of Vermont, Burlington, VT), Stephanie E. Hurley (University of Vermont, Burlington, VT), Taylor H. Ricketts (University of Vermont, Burlington, VT), Simon N. Jorgenson (University of Vermont, Burlington, VT), Cari Ritzenthaler (Lake Erie College, Painesville, OH), Tre McCarney (Shelburne Farms, Shelburne, VT), Megan Camp (Shelburne Farms, Shelburne, VT),and Dana Bishop (Shelburne Farms, Shelburne, VT)

Abstract - Wild pollinators play a vital role in both wild and crop ecosystems, but many species are in decline due to habitat loss, pests, pathogens, pesticide use, and climate change. Compounding these issues, public understanding of wild pollinators is also very low, with pollinator discourse often focused only on managed *Apis mellifera* (Honeybee). Education programs can raise awareness of the importance of wild pollinators alongside Honeybees and can provide people with tools to take conservation action to protect them. However, a well-documented "value–action gap" in the literature demonstrates that strong environmental knowledge and values do not always lead people to engage in conservation actions themselves. Little research examines whether environmental education programs lead to sustained conservation action beyond immediate post-event intentions. Our study specifically explores this gap, examining whether pollinator-education programs at Shelburne Farms (SF), a nonprofit farm and education center in Vermont, can inspire participants to take direct conservation actions to protect pollinators at home. Throughout summer 2025, L. Spencer led 93 farm visitors on 2-hour-long guided pollinator walks at Shelburne Farms, introducing pollinator ecology topics and conservation strategies. Participants completed brief pre- and post-walk surveys to assess changes in pollinator-related knowledge and values and were also invited to make a written "pollinator pledge", a written commitment to act, at the conclusion of the walk. Participants were reminded of their pollinator pledge in January 2026, and follow-up surveys sent in May 2026 will assess whether they followed through on the pledge and what helped or hindered their follow through. Our findings should inform future education programs aimed at translating environmental knowledge and values into sustained, actionable conservation outcomes.

Sat-PM2-A-4

Invasive Plants as Chemical Filters Shaping Insect Communities

Joseph K. Staples (University of Southern Maine, Department of Environmental Science and Policy, Gorham, ME)

Abstract - Across New England, as in many other regions, invasive plant species often form dense single-species stands that appear highly productive. Despite this apparent productivity, habitats dominated by invasive nonnative plants are frequently associated with reduced insect abundance and species richness, particularly among herbivorous insects. Although the impacts of invasive plants on arthropod communities and other animal taxa have been documented, the mechanisms driving these declines and their cascading effects on higher trophic levels remain poorly understood. This review synthesizes current research on invasive plant-dominated habitats in New England, with an emphasis on chemical ecology and system-level impacts. I discuss evidence linking invasive plant chemistry to herbivore performance and higher trophic levels, outline future research directions to explore the biological mechanisms that affect arthropods and ecosystem function, and consider how insect–plant chemical ecology may be leveraged to manage invasive arthropod pests.

Sun-PM2-A-2

Herbarium Specimens and Genomics Reveal Ancient Hybridization in Royal Ferns

Cy Stavros (University of Vermont, Burlington, VT) and Weston Testo (University of Vermont, Burlington, VT)

Abstract - *Osmunda spectabilis* (American Royal Fern) and *Osmunda claytoniana* (Interrupted Fern) commonly co-occur across the eastern US and Canada, yet the plant that is believed to be their hybrid, *Osmunda* × *ruggii*, appears to be exceptionally rare. Herbaria allow us to not only unravel the story of the natural occurrence and human-mediated movement of these rare hybrids, but also to confirm the parentage of these plants with genomic data. Additionally, by combining this data with a collection of exceptionally preserved fossils, we are able to infer that the 2 parental species of this hybrid diverged from one another deep in evolutionary time. This places them among the most distantly related species known to hybridize—and might explain their hybrid's rarity today.

Sat-PM2-C-4

Assessing the Wounds, Planting the Cure: A Three-Tiered Framework for Experiential Natural History

Trevien Stanger (Ecological Restoration Program Manager, The Patrick '61 and Marcelle Leahy Institute for the Environment, Saint Michael's College, Colchester, VT)

Abstract - An ecological education, according to revered 20th-century conservationist Aldo Leopold, can make us feel that we "live alone in a world of wounds". This sentiment can lead to despair … or to action. But what sort of action? Recycling? Shorter showers? Attempts to "shrink our ecological footprint"? Ecological restoration, and its wild cousin permaculture, propose a different response: we should increase our ecological footprint by actively addressing the wounds in our landscape through active, community-driven ecological restoration. At the Saint Michael's College Natural Area—a 26-ha former dairy farm and extractive cornfield—we are piloting this generative approach. Through a mix of passive restoration ("no mow") and active restoration, we are transitioning the stewardship of our campus from traditional resort-style control to an ecologically informed, "work with Nature" approach. In the process, students engage with the landscape as active, functional members of the place itself through a 3-tiered framework: (1) landscape literacy: students "read" the history of the land, with both deep-time perspectives and more recent changes in land-use patterns from forest > farm > back to forest; (2) diagnostic engagement: students identify "wounds", such as invasive-species monocultures, degraded soil from decades of corn production, and denuded riparian areas, and learn about way to assist in the recovery of these disturbances; and (3) ecological healing: students move beyond passive observation into active stewardship by planting native species—including *Platanus occidentalis* (American Sycamore), *Cornus sericea* (Red-osier Dogwood), and shrub willows (*Salix* spp.)—to underpin the food web and stabilize the floodplain. These plantings are partly led by upper-level students in our Leahy Institute for the Environment's "Ecological Restoration Program". This hands-on work demonstrates that when students plant trees to kickstart ecological healing, they aren't just restoring an ecosystem—they are restoring their own relationship with the natural world and turning environmental despair into tangible agency.

Sun-AM2-F-2

The Consortium of Northeast Herbaria (CNH): Advancing Collaboration, Digitization, and Biodiversity Research and Conservation for Nearly 20 Years

Patrick W. Sweeney (Yale University Herbarium, Yale Peabody Museum, New Haven, CT)

Abstract - The Consortium of Northeastern Herbaria (CNH) was founded in 2008 to unite herbaria in northeastern North America and provide online access to specimen data housed in member institutions, with a particular focus on regional collections. From its modest beginnings of fewer than a dozen herbaria representing 6 US states and 1 Canadian province, membership has grown to more than 90 herbaria across 14 states and provinces. The collective efforts of these institutions have generated and mobilized millions of digitized occurrence records and images. These data support biodiversity research, conservation, education, and outreach at a wide range of scales. This presentation will offer a brief history of the consortium, highlight significant activities and outcomes from the CNH region, and discuss future directions.

Sat-AM1-C-1

Linking Patterns to Processes in Teaching Ecology Using the Lake-in-a-Tube Microcosm System

Brian Swisher (Saint Michael's College, Colchester, VT)

Abstract - From its beginnings as a primarily descriptive science focused on observable patterns, natural history as a field has broadened to include more mechanistic understanding of the processes that produce patterns in nature. For students of ecology, providing lab experiences that link process and pattern can improve understanding and motivation for doing science. The lake-in-a-tube (LIAT) microcosm system allows students to create controlled, replicated experiments investigate the ecology and water quality of lakes. Students readily observe changes in algae population sizes over short time scales and can quantify algae density using a variety of methods. The intuitive nature of LIAT allows students to view the outcomes of their experiments in real time and relate their results to the phenomena of nuisance and hazardous algae blooms, which is a world-wide concern. This presentation will introduce the system's components and provide examples of how LIAT is currently being used in high-school and college-level curricula. Additional information can be obtained at www.lake-in-a-tube.com.

Sat-AM2-A-1

Connecting the Land to the Classroom Lab: Assaying Soil Nutrient Contributions to Algae Blooms

Brian Swisher (Saint Michael's College, Colchester, VT)

Abstract - The introductory biology curriculum at Saint Michael's College features a lab program that connects field and laboratory experiences to understand factors contributing to nuisance and hazardous algae blooms in lakes. Using our campus as our field site, students ask the question "What would happen if the soil at our feet erodes into the Lake Champlain watershed?" Students observe and collect soils associated with several different land uses, create sediment by mixing the soils with water, then assay the effects this artificial stormwater on algae population growth in lake-in-a-tube microcosms. They subsequently relate their resulting data to their knowledge of soil nutrients derived from readings and short lectures from on-campus experts. This talk will highlight the field and lab experiences, present examples of the resulting data, and provide recommendations for adopting this approach in other educational settings.

Sun-PM2-F-1

Bias in Measurements of Snakes Restrained by Extension and in a Novel, Portable Confinement Chamber

Tigran Tadevosyan (Oxbow Associates Inc., Boxborough, MA), Scott Smyers (Oxbow Associates Inc., Boxborough, MA), Brian Butler (Oxbow Associates, Boxborough, MA), Dominic Kemmett (Oxbow Associates Inc., Boxborough, MA), and Gregory Mertz (New England Wildlife Center (NEWC), Weymouth, MA)

Abstract - Restraint of snakes is commonly needed for various scientific and veterinary medical procedures. While measurements are traditionally taken by extending along a ruler (EX), squeeze boxes (SB) have been widely used as an alternative restraint method to mitigate the drawbacks of extension. We designed and tested a compact, portable confinement chamber permitting dorsal and ventral examination, photography, and measurements. Our model comprises 2 acrylic sheets (45 cm x 45 cm x 0.5 cm), separated by a 5 cm-wide foam frame. The entire assembly is secured using eight (70 mm x 9 mm) bolts and binder clips and weighs 2.75 kg. Simple assembly enhances portability and part replacement and allows thorough cleaning and sanitation. To establish conversion between measurements obtained with 2 methods, we compared 110 paired measurements of snout–vent length (SVL) obtained from *Crotalus horridus* (Timber Rattlesnake) and *Agkistrodon contortrix* (Eastern Copperhead) restrained in a confinement chamber (SVL_{SB}) and extended along the measuring tape (SVL_{EX}). The linear relationship between SVL_{EX} and SVL_{SB} is described by the equation: $SVL_{EX} = 20.746 + 1.0806 * SVL_{B}$. Prediction range for SVL_{EX} from SVL_{SB} was ± 52.3 mm, at 95% confidence interval. Difference between paired measurements (SVL_{EX} - SVL_{SB}) plotted against pairwise averages (Bland–Altman plots) revealed an average bias = 65.57 ± 31.98 mm (11 ± 4.5% SVL), which was significantly different among some 100-mm SVL intervals (ANOVA: $F = 6.31$, $P < 0.001$). The ratio of the difference to the average SVL was unbiased and normally distributed, similar to the regression residuals. We conclude that estimates of SVL_{EX} based on SVL_{SB} calculated using linear regression are similar to those calculated by adding average bias, with discrepancies between 15 mm and 10 mm, pronounced at both ends of the span of SVL values (200–1100 mm).

Sat-PM1-A-3

Demographic Assessment of Snakes in Norfolk County, MA

Tigran Tadevosyan (Oxbow Associates Inc., Boxborough, MA), Scott Smyers (Oxbow Associates Inc., Boxborough, MA, Brian Butler (Oxbow Associates, Boxborough, MA), Dominic Kemmett (Oxbow Associates Inc., Boxborough, MA), Kyle Cormier (Oxbow Associates Inc., Boxborough, MA), Ron Strohsahl (Oxbow Associates Inc., Boxborough, MA), Spencer Campbell (Oxbow Associates Inc., Boxborough, MA), Thomas Palmer (Oxbow Associates Inc., Boxborough, MA), Joe Martinez (Oxbow Associates Inc., Boxborough, MA), James Condon (Oxbow Associates Inc., Boxborough, MA), Gregory Mertz (New England Wildlife Center (NEWC), Weymouth, MA), Daniel Wright (Massachusetts Department of Conservation and Recreation, Boston, MA), and Michael T. Jones (Massachusetts Division of Fisheries and Wildlife, Westborough, MA)

Abstract - We assessed population size and demographics of Massachusetts State Endangered *Crotalus horridus* (Timber Rattlesnake) and *Agkistrodon contortrix* (Eastern Copperhead) on public land in Norfolk County, by conducting a 3-year mark–recapture study between 2022 and 2024. We visually surveyed snakes in the afternoons during spring emergence and egress at 15 scattered hibernacula complexes, 3 of which are being reported for the first time. During each survey, we documented air and ground temperatures, wind, gust, cloud index, and precipitation at the beginning of the day. Further, we documented survey effort at each hibernacula complex, counted snakes, and estimated catch per unit effort (CPUE) for each species at each site per year and cumulatively. When it was possible, we captured individual snakes, using hooks or tongues, examined, measured, photographed, and sex-determined in a retention chamber, scanned for pit tags, and if not already tagged, aseptically prepared and subcutaneously pit-tagged snakes using disposable sterile hypodermic needles, closed perforations with surgical glue, and released snakes at the capture site. For each species, we compiled capture histories and analyzed them using open- and closed-population models. The total survey effort of 184.79 person-hours resulted in 293 encounters of Eastern Copperheads (cumulative CPUE = 1.58 s/p/h) and 133 Timber Rattlesnakes(cumulative CPUE = 0.72 s/p/h, 2.19 times fewer). No hibernating rattlesnakes were encountered north of the road splitting the park, where these snakes were not uncommon 100 years ago. We further elaborate on the closed-population and open-population (Jolly–Seber) model-based estimates for both pit viper species, by year. Other common snake species native to the park, such as *Coluber constrictor* (Black Racer), *Lampropeltis triangulum* (Eastern Milksnake), *Thamnophis sirtalis* (Eastern Gartersnake), as well as introduced *Pantherophis alleghaniensis* (Eastern Ratsnake) and *P. spiloides* (Gray Ratsnake), were rarely encountered, suggesting declines in the entire assemblage of snakes.

Sun-AM1-A-2

Egg Neglect and Egg Cold Tolerance in Storm-Petrels

Liam U. Taylor (Bowdoin College, Brunswick, ME), Kayla E. Lichtner (Bucknell University, Lewisburg, PA), Mark F. Haussmann (Bucknell University, Lewisburg, PA), Robert A. Mauck (Kenyon College, Gambier, OH), and Patricia L. Jones (Bowdoin College, Brunswick, ME)

Abstract - While most birds keep their eggs consistently warm to protect their sensitive, developing embryos, some seabirds neglect their eggs (i.e., leave them cold) for days, or even weeks. Here, we combine field data and computational modeling to examine the role of egg cold tolerance in seabird reproduction. Using field data from a decades-long study of *Hydrobates leucorhous* (Leach's Storm-Petrel), we measured the frequency, limits, and consequences of egg neglect. Using a computational model of storm-petrel incubation, we show that neglect is an inevitable outcome of biparental care in seabirds, which requires both parents to travel long distances between the nest and foraging grounds. The model quantifies how hatching success is highly sensitive to the evolution of egg cold tolerance in this system. Even good parents in good environments can fail to reproduce if the egg is not cold tolerant. We discuss how convergent evolution in 2 independent lineages of seabirds (Procellariiformes and Charadriiformes) provides the opportunity for phylogenetic and genomic analyses of egg cold tolerance. Overall, our study highlights how the physiology of offspring—in addition to the behavior of parents—is a critical determinant of reproductive outcomes.

Sat-PM1-B-1

Overcompensation Following Simulated Partial Herbivory in *Dryopteris intermedia* (Common Wood Fern)

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

Abstract - Forest understory plants are often subjected to herbivory, both by large mammals and insects. I have observed sawfly larvae feeding on the tips of leaves of *Dryopteris intermedia* (Common Wood Fern) in the Adirondack and Catskill Mountains of New York State. To assess the responses of the fern to this herbivory in a hardwood forest in the Catskills, I experimentally removed the fleshy part of the leaf for one-third of its length, two-thirds of its length, or none of its length of all leaves on 20 blocked replicates and measured the sizes of original leaves and new leaves that grew after clipping. I also measured the frequency of background herbivory in the stand. Sixty percent of plants and 30% of leaves had signs of larval herbivory. The mean length of leaf affected by background herbivory was 6.2% and the min–max was 0–71.6%. New leaves that grew following experimental clipping were smaller than the original leaves, but greater in length than the amount of leaf area removed. Plants with two-thirds of their leaves removed made more new leaves than both the control plants and the plants with one-third of their leaf removed. Plants with one-third of their leaf area removed gained more leaf area in the new leaves than they lost in the removal. Partial herbivory is common in Common Wood Ferns and leads to leaf replacement and, at lower levels of herbivory, overcompensation in leaf-area production.

Sun-AM1-B-3

Environmental DNA Application to the Threatened Ringed Boghaunter (*Williamsonia lintneri*) in Maine

Christiana K. Teye (University of Maine, Orono, ME)

Abstract - *Williamsonia lintneri* (Ringed Boghaunter) is a rare dragonfly with a poorly documented distribution, which is difficult to distinguish from the non-endangered *W. fletcheri* (Ebony Boghaunter). Traditional surveys are challenging because both species occupy similar habitats and have brief early flight periods. My Ph.D. research seeks to develop and apply an environmental DNA assay to detect Ringed Boghaunter from water samples and exuviae collected in Maine, where the species is state-threatened. The resulting data will improve understanding of its distribution and habitat use and support informed conservation planning in New England.

Sun-AM1-C-2

Invasive Plants in Northeastern Grasslands: An Emerging Threat

Kevin Tolan (Vermont Center for Ecostudies, Norwich, VT)

Abstract - Grasslands are among the most heavily degraded biomes, and the ground-nesting birds that depend on them for breeding are the most rapidly declining bird guild in North America. Although avoiding management during the breeding season has been shown to greatly increase the reproductive success of grassland birds, such as *Dolichonyx oryzivorus* (Bobolink) and *Passerculus sandwichensis* (Savannah Sparrow), it also permits forbs and invasive plant species to spread, often outcompeting the grasses required for nesting. This situation is particularly problematic as invasion by nonnative plants can render established best-management practices, such as delayed mowing, ineffective for conserving breeding habitat. While invasive plants have been identified as a major emerging threat to grassland birds, relatively little research has quantified their impacts or incorporated their control into existing management recommendations. Here, I review current knowledge of invasive grassland vegetation in the Northeast, summarize ongoing conservation efforts, and outline priorities for future management and study.

Sun-AM2-A-3

Northeastern Alpine Plant Phenology: Links Between Temperature, Snow, and Topography

Jordon Tourville (Appalachian Mountain Club, Gorham, NH), Jonathan Chipman (Dartmouth College, Hanover, NH), Warren Galloway (Dartmouth College, Hanover, NH), Georgia Murray (Appalachian Mountain Club, Gorham, NH), Morgan Southgate (Appalachian Mountain Club, Gorham, NH), and Sarah Nelson (Appalachian Mountain Club, Gorham, NH)

Abstract - Most alpine plants in the northeastern US are perennial, and many flower as early as possible given their limited growing season. Thus, they risk the loss of reproductive effort to late frosts. Previous evidence suggests that alpine plants in the region are relatively insensitive to fluctuations in macro-scale free-air temperature; however, they may respond more to changes in both surface temperature and growing-season length at extremely fine scales, which are influenced by microtopography, and by extension, snowpack dynamics. Using multiple years of phenology data collected by Appalachian Mountain Club (AMC)-affiliated community-scientists through the National Phenology Network (NPN) and iNaturalist, we examined the role of fine-scale spatial variation of snowmelt, topography, and surface temperature on spring flowering of 12 alpine plant taxa on alpine peaks (ranging west to east) from the Adirondacks to Katahdin. Environmental data were remote-sensed from a combination of sources (Landsat-based snow indices, lidar-based digital elevation models, and in-situ microclimate sensors). We find that day of year for flowering (DOY) is best predicted by local surface temperature (opposed to macroclimate free-air temperature), topographic exposure, and spring snowmelt date (SMOD) across our focal taxa. In general, earlier flowering occurs in warmer springs, areas that are more topographically exposed (areas higher than the surrounding landscape), and areas that melt out earlier in the season. Plants found in the latest-melting sites, particularly in snowbank communities, are particularly sensitive to SMOD, usually flowering within a week of snowmelt, indicating a tight coupling between snowpack duration and flowering. Transitional plant species, those found at both low and high elevations in the region, display much greater temperature sensitivity than arctic-alpine specialists. Using phenology as a bell-weather for plant response to global changes in northeastern alpine, the results presented here highlight taxa and locations that may be the most vulnerable as climate change accelerates (e.g., rare snowbank plant communities).

Sun-AM2-E-

Stream Restoration as a Climate-Adaptation Tool

Rick Van de Poll (Ecosystem Management Consultants, Center sandwich, NH) and Allie Byrd (Tin Mountain Conservation Center, Albany, NH)

Abstract - Tin Mountain Conservation Center has been restoring upper perennial streams since 2010 in order to improve habitat for *Salvelinus fontinalis* (Eastern Brook Trout) in northern New Hampshire. Most of this work has involved the careful placement of coarse woody material in known trout streams to enhance scour pool formation and diversify substrates. In 2018, strategic wood additions (SWA) were written into NH Wetland Rules as a recognized stream-restoration tool. Both Tin Mountain and the Natural Resource Conservation Service (NRCS) had a hand in writing the required guidelines for this permitted activity. Careful monitoring of pre- and post-treatment conditions have shown that not only has trout density and biomass improved after treatment, but other shifts in critical parameters associated with off-setting the impacts of climate change have also taken place. These changes include desynchronization of flood flows, minimizing bank erosion, trapping of sediments, improving aquatic macro-invertebrate diversity, and reconnecting floodplains. This talk will review the SWA techniques used that can help restore stream health and be more resilient in adapting to an increase in flooding due to climate change.

Sat-PM1-D-4

Crossing Sacred Land

Rick Van de Poll (Ecosystem Management Consultants, Center sandwich, NH)

Abstract - What if the land isn't something we own—but something we've forgotten how to listen to? All land is sacred. It feeds us, shelters us, carries us, and gives us water to live. Without it, none of us would be here. And yet, somewhere along the way, we lost our sense of relationship with the Earth—and with our responsibility to care for it. Both in my life and in my work as an environmental consultant, I witness this disconnection firsthand and have written a book, *Crossing Sacred Land*, a quiet but hopefully powerful collection of poetry on who we are, where we came from, and how deeply intertwined our lives are with the living world. Moving across deep time—from the origins of life on Earth through the age of dinosaurs, nomadic cultures, and the long arc of human evolution—the pages it contains offer stories, observations, and reminders meant to reconnect us to the ground beneath our feet. I will share some pieces from this work.

Sat-AM2-F-5

Record High Occurrence of Leg Damage in Leach's Storm-Petrel on a Maine Island

Jackson van Pelt (College of the Atlantic, Bar Harbor, ME)

Abstract - Leg damage has been previously noted in *Hydrobates leucorhous* (Leach's Storm-Petrel) breeding in the north Atlantic. During the summer of 2025, I recorded instances of foot or leg deformity, injury, or disease in breeding petrels on Great Duck Island, ME. I sampled birds as part of ongoing research into site fidelity and breeding success. Breeding Storm-Petrels on Great Duck showed an unusually high (>29%) occurrence of leg damage. Damages were primarily broken and healed bones and missing portions of the toes or webbing. Additionally, 2 instances of developmental abnormality, 3 of diseased legs/feet, and 1 complete amputation of the foot were recorded. Aside from disease, all recorded damages were fully healed. This island's location at the southern edge of this petrel's breeding range disputes the south–north increase in damages presented in previous papers. The nature of the recorded damages suggests predatory pressure by marine organisms during the time petrels spend foraging or resting at sea and increases our understanding of the pressures faced by this globally threatened species.

Sat-PM1-B-2

Fall Activity Patterns and Potential for Non-Cavernicolous Hibernation by Bats in New Hampshire

Jacques Pierre Veilleux (Franklin Pierce University, Rindge, NH), Logan Stecker (Antioch University, Keene, NH), Ella Rogers (Franklin Pierce University, Rindge, NH), and Olivia Wood (Franklin Pierce University, Rindge, NH)

Abstract - White-nose syndrome (WNS) is a wildlife disease which has caused dramatic declines in many North American bat species. First detected in New Hampshire during the winter of 2008/2009, WNS has led to a >99% loss of the state's hibernating bat population. Acoustic survey data from fall (2024) of bat activity at New Hampshire hibernacula indicate that bats are present as the hibernation period approaches, but not within hibernacula during winter. Recent evidence indicates that some bats in the Northeast hibernate in non-cavernicolous (e.g., rock outcrops) hibernacula, rather than in caves or mines. The goal of this research was to determine fall bat activity during the pre-hibernation season, as well as the potential for crevices associated with rock outcrops to serve as hibernation sites for bats (focusing on *Eptesicus fuscus* [Big Brown Bat], *Perimyotis subflavus* [Tri-colored Bat], *Myotis leibii* [Eastern Small-footed Bat], *M. lucifugus* [Little Brown Bat], and *M. septentrionalis* [Northern Long-eared Bat]). Surveys took place at the US Army Corps of Engineers Surry Mountain Lake (SML) facility located in southwest New Hampshire (Cheshire County, Surry Township). We deployed 8 acoustic detectors (Song Meter Mini Bat) at the SML from 1 September through 30 November 2025. Detectors were operational nightly from 30 min prior to sunset until 30 min after sunrise. We set 5 temperature data loggers (Elitech RC-51H) at the SML; 1 was used to monitor ambient temperature and 4 were placed within rock crevices determined to provide potential habitat for winter hibernation. We programmed the data loggers to collect temperature readings once per hour from 1 November 2025 through 28 February 2026. Are currently analyzing acoustic data (Kaleidoscope Pro, Wildlife Acoustics) to verify species composition and phenology patterns. Temperature data loggers continue to collect data through 28 February. Pre-analysis of acoustic survey data yielded 15,384 recordings, with bats active as late as 28 November. We will present details of species composition and patterns of bat activity across the survey period. We will analyze temperature data to determine the potential for rock crevices to serve as non-traditional hibernation sites (i.e., crevice temperatures remaining above 0 °C) at the SML.

Sat-AM1-D-4

Standardized, Network‐Scale Water Quality Data from NEON's In Situ Aquatic Instruments and Observations

Annie Vincent (National Ecological Observatory Network - Battelle, Fitchburg, MA) and JoLeisa Hayes (National Ecological Observatory Network - Battelle, Fitchburg, MA)

Abstract - The National Ecological Observatory Network (NEON) is a continental-scale observation facility that collects long-term, open-access ecological data to better understand how ecosystems are changing across the US. NEON provides data from 81 terrestrial and aquatic field sites, including 3 in the Northeast. NEON data cover a range of subject areas within ecology, including organismal observations, biogeochemistry, hyperspectral imagery, and micrometeorology. NEON's freshwater data assesses chemical, biological, and morphological conditions of streams and lakes, such as surface and groundwater quality, population dynamics, and hydrologic processes. All samples and data collected by NEON are publicly available and can be accessed digitally through the NEON data portal. This presentation will introduce NEON's aquatic instrument and observational sampling systems present at 34 freshwater field sites. It will showcase how NEON's freshwater data can be used to assess water quality, with a focus on in-situ instrumentation in the Northeast, as well as on the continental scale.

Sat-AM1-A-3

Phenological Shifts in Relation to Temperature Trends in Bennington, Vermont

Alejandra Vouga Aguilera (Bennington College, Bennington, VT), Kerry Woods (Bennington College, Bennington, VT), Caitlin McDonough McKenzie (Bennington College, Bennington, VT), Kathryn Montovan (Bennington College, Bennington, VT), Dor Ben-Amotz (Bennington College, Bennington, VT), and Blake Jones (Bennington College, Bennington, VT)

Abstract - This project uses a long-term phenology archive collected by the Bennington College community between 1987 and 1999. The dataset consists of handwritten field observations initiated by Professor Kerry Woods and maintained by community members to document seasonal biological events. Archival work began in April 2024, with an initial focus on preparing the data before exploring whether historical records of spring activity could reveal patterns related to climate and weather variability. We analyzed first annual observations for multiple species to investigate how the timing of seasonal activity has changed through time, using data-science tools to organize, visualize, and interpret the records. We assessed whether species appearances tended to shift earlier or later across years and compared phenological records with temperature information to examine whether warmer conditions are associated with earlier seasonal events. This project highlights the integration of environmental and data science, illustrating how careful collection, documentation, and interpretation of community-built datasets allows closer observation of ecological patterns and emphasizes the importance of preserving long-term data for understanding seasonal and environmental change.

Sat-PM2-C-3

Emergence Phenology of the Ringed Boghaunter Dragonfly in Maine

Mark A. Ward (Ecological Consultant, Bristol, ME) and Phillip deMaynadier (Maine Department of Inland Fisheries and Wildlife, Augusta, ME)

Abstract - *Williamsonia lintneri* (Ringed Boghaunter) is a globally rare dragonfly and listed as a threatened species in the state of Maine. For more than 2 decades, we have monitored 2 Ringed Boghaunter populations for first emergence in southern Maine. Doing so helps to inform timing of field surveys for the identification of new populations. Our monitoring data suggests a pattern of earlier emergence in recent years with >2/3 of first detection dates since 2019 occurring earlier than median dates. Is this a consequence of a warming climate or a reflection of some other factor such as improved detectability over time? We examine the complexities of odonate-emergence phenology data and the challenges associated with trend analysis. Even after excluding data points considered of lower accuracy, we found that the trend toward earlier emergence persisted. Rolling calculations of median emergence dates through time also support a trend toward earlier emergence, likely explained by a warming climate.

Sun-AM1-C-3

Stalking the Ringed Boghaunter: Detection Challenges for an Elusive Dragonfly in Maine

Mark A. Ward (Ecological Consultant, Bristol, ME) and Phillip deMaynadier (Maine Department of Inland Fisheries and Wildlife, Augusta, ME)

Abstract - *Williamsonia lintneri* (Ringed Boghaunter) is an elusive dragonfly with a global distribution limited to the Northeast and upper Midwest. First discovered in Maine in 1995, the Ringed Boghaunter is listed as state-threatened and globally rare (G3) by NatureServe. The Maine Department of Inland Fisheries and Wildlife has conducted regular surveys to assess its distribution and status in the state. Surveys have been challenging because of its brief flight period, its tendency to spend the flight period away from breeding wetlands, and the difficulty distinguishing its larvae from those of *Williamsonia fletcheri* (Ebony Boghaunter), a widespread species in Maine. Over the last 30 years, we have fine-tuned techniques to identify and score potential breeding wetlands for this species in Maine and developed an evidence-based categorization of breeding status at wetlands where *Williamsonia* evidence has been detected. Nevertheless, challenges remain to identify and protect habitat for this rare species.

Sun-AM1-C-1

Shells in the Spruce: Marine Prey in the Coastal Forests of Acadia National Park

Hannah Webber (Schoodic Institute at Acadia National Park, Winter Harbor, ME), Shannon O'Brien (Schoodic Institute at Acadia National Park, Winter Harbor, ME), Megan Wenner (Schoodic Institute at Acadia National Park, Winter Harbor, ME), and Eleanor Freed (Schoodic Institute at Acadia National Park, Winter Harbor, ME)

Abstract - Coastal forest food webs link terrestrial predators with marine prey. The spatial scale and vulnerability of these cross-ecosystem interactions remain poorly understood. As climate change alters intertidal prey availability through ocean warming and acidification, and human development constrains terrestrial habitat, understanding how marine subsidies support coastal forest consumers is increasingly important. In 2025, we initiated a multi-year study of the coastal forest food web in Acadia National Park, ME, comparing sites near human-built infrastructure with sites farther from development. At each site, we quantified intertidal prey availability using shore-perpendicular transects, assessed marine prey use by terrestrial consumers through shell-remnant surveys in forest plots, and documented predator activity using motion-activated trail cameras. Across 8 forest plots, we recorded 380 shell remnants representing 10 focal intertidal invertebrate species. *Mytilus edulis* (Blue Mussel) and *Strongylocentrotus droebachiensis* (Green Sea Urchin) dominated shell assemblages. Intertidal surveys spanning 27 transects (1749 points) revealed that *Littorina* spp. (Littorinid snails) and *Carcinus maenas* (Green Crab) were the most widespread taxa, with no clear correspondence between intertidal availability and forest shell assemblages. Trail cameras captured >23,000 images, 5% of which include *Corvus brachyrhynchos* (American Crow) transporting intertidal prey into forested habitats. Together, these results establish a baseline for quantifying marine–terrestrial linkages in coastal forests and provide a foundation for assessing how climate change and human development may reshape coastal food webs over time.

Sat-AM2-B-1

Round Goby Management Efforts in the Lake Champlain Watershed

Elizabeth Whitmore-Stolar (NYS DEC Region 5 / Lake Champlain Basin Program, Warrensburg, NY), Erin Vennie-Vollrath (NYS DEC Region 5 / Lake Champlain Basin Program, Ray Brook, NY), and Meg Modley Gilbertson (Lake Champlain Basin Program, Grand Isle, VT)

Abstract - *Neogobius melanostomus* (Round Goby) are small benthic fish that are native to Eurasia and were first found in the Great Lakes Basin in 1990. They have since spread through the Erie Canal to the confluence of the Hudson and Mohawk rivers where they were found below the first lock of the Champlain Canal in 2021. There is concern about the impact Round Goby would have on the Lake Champlain ecosystem if it were to invade. State, Federal, and international partners have been working together on early detection monitoring, management efforts to prevent spread, and education and outreach initiatives to prevent Round Goby from entering Lake Champlain.

Sun-PM2-A-6

Resurveying the Green Mountain State: Preliminary Findings from the Second Vermont Butterfly Atlas

Dana M. Williams (Vermont Center for Ecostudies, White River Junction, VT), Kent McFarland (Vermont Center for Ecostudies, White River Junction, VT), Mike Hallworth (Vermont Center for Ecostudies, White River Junction, VT), and Jason T. Loomis (Vermont Center for Ecostudies, White River Junction, VT)

Abstract - To make effective conservation-management decisions, we need up-to-date, high-resolution data—especially as biodiversity rapidly shifts in response to climate change and habitat fragmentation. This effect is especially pronounced for insects, where many species face steep declines or lack sufficient data to measure trends. Yet, professional biologists struggle to collect these comprehensive datasets due to time and budget constraints. Community science efforts, like atlases, can overcome this issue by engaging volunteers in biodiversity data collection. These efforts expand our geographic reach for data collection and foster a more science-literate public that is deeply invested in their local environment. In 2023, the Vermont Center for Ecostudies launched the Second Vermont Butterfly Atlas, a 5-year, community science effort to document butterfly species across the state and the first repeat atlas effort in the country. This data will provide us with a unique, 20-year comparative lens through which to view butterfly population dynamics. As we enter our fourth year, we present preliminary findings from the Atlas including records of new state migrants, the role of new technologies like smartphone apps in amplifying volunteer participation, and how our results compare with regional and historical butterfly population trends.

Sat-PM2-E-4

Highlighting Herbarium Gaps with Noteworthy Records of *Usnea*

Caroline Witherspoon (SUNY ESF, Syracuse, NY), James Lendemer (New York State Museum, Albany, NY), John Roberts (SUNY ESF, Syracuse, NY), and Gregory McGee (SUNY ESF, Syracuse, NY)

Abstract – While conducting field work in the Adirondacks, I found 3 significant records of *Usnea* (old-man's beard) lichens. Two species were not known to have modern occurrences in New York, and 1 has never been known to occur in upstate New York. While investigating the herbarium records of these and other *Usnea* species to map historical and modern distributions, we experienced many difficulties with the available data. I will review the significance of the 3 new records and discuss the inconsistencies and labor involved through the data cleaning and mapping process.

Sat-AM1-E-1

Old-Growth Mesic Forests Reflect Specific Stand Histories Over Decades to Centuries

Kerry D. Woods (Bennington College, *emeritus*, Bennington VT; Huron Mt. Wildlife Foundation, Big Bay, MI)

Abstract - I used longitudinal data with multiple remeasurements of >15,000 trees in stem-mapped plots over 30-89 yr, with ~500 increment cores, from 2 old-growth mesic forests in northern Michigan to describe population and system dynamics, and to assess a range of assumptions and models regarding such forests. Both stands lack evidence of fire over at least ~500 years. Demographic properties of dominant tree species were non-equilibrial at decadal scales, even in the absence of significant disturbance, while biomass density remained relatively constant. Less shade-tolerant species declined relative to more-tolerant species, and size distributions were increasingly dominated by the largest size classes. In the absence of major disturbance events, mortality risk was strongly related to growth rate. Best models for tree growth vary among species and time intervals, but generally show important influence of tree size and neighborhood competition. Overall, biomass growth was contributed disproportionately by canopy trees 30-60 cm DBH, even though larger stems added more biomass individually and accounted for most dead-wood input. Response to a significant mid-study blow-down at 1 site, along with historical reconstructions from permanent plot records and increment cores, suggests that such events structure stand dynamics for periods up to centuries, punctuating and shaping slower dynamics over intervening decades and centuries. I argue that structure and function of these old-growth forests can only be understood in the context of their particular histories. Ecological models of late-successional mesic forests increasingly acknowledge such "historical contingency", but popular ideas about and approaches to conservation of old-growth forests often remain anchored in deep-rooted equilibrial models, which may prove problematic.

Sat-PM2-D-6