

CONNECTIONS:

MERGING METHODS, SHARING
PERSPECTIVES, AND CONNECTING PEOPLE



Entomological Society of British Columbia

2026 Conference and AGM



UBC Land Acknowledgement

We would like acknowledge the land on which we gather for this conference is the traditional, ancestral, and unceded territory of the *xwməθkwəy̓əm* (Musqueam) People.

Meeting Location (UBC)

**Multipurpose Room, Rm 1014/1024
Biodiversity Research Centre, 2212 Main Mall,
UBC Vancouver**





ESBC Conference 2026: CONNECTIONS: Day 1

Friday, October 16th



9:00 AM - Welcome & Opening Remarks - Dr. Michelle Tseng, ESBC President

Plenary 1 (9:10 AM - 9:40 AM)

Moderator: Michelle Tseng

The Power of Connection: How Participation Creates Meaningful Change

Dr. Erin Roger, Director, Nature, The David Suzuki Foundation

Abstract: The global decline of insect populations has consequences for biodiversity and ecosystem functioning, while simultaneously offering unprecedented opportunities for public engagement, discovery, and conservation. Reflecting on over fifteen years of working in conservation spanning Australia and Canada, this talk explores how community science, emerging technologies, arts-based engagement, and biodiversity stewardship are transforming our relationship with insects and the landscapes they inhabit.

Drawing on examples from my experience working for the Atlas of Living Australia, Australia's national online biodiversity database, I'll discuss efforts to monitor Christmas Beetles via the nationwide Christmas Beetle Count, Bogong moth monitoring and the innovative citizen-powered biosecurity alert service. Examples which highlight how public-researcher connections can generate critical knowledge about species decline, distribution, and emerging threats.

My work at the David Suzuki Foundation offers complementary lessons. Through initiatives such as Butterflyway Project, and Butterflies in My Back Yard (BIMBY), communities are creating habitats, fostering ecological literacy, and building emotional connections with the species that share our neighbourhoods.

At the heart of these efforts lies an explosion of biodiversity data generated through platforms such as iNaturalist. Millions of observations are enabling researchers and communities alike to track insect populations, identify range shifts, and document species in real time. Combined with emerging geomodel detection and predictive mapping tools, these observations are helping reveal hidden patterns and guide conservation action at unprecedented scales.

Yet understanding ecological change requires more than better data. The keynote will examine how we've begun using initiatives such as Shifting Baseline Syndrome and Rewilding Arts to communicate about environmental change. Shifting baseline is the phenomenon through which each generation accepts a progressively diminished natural world as normal. Insects, often overlooked despite their ecological importance, provide some of the clearest evidence of this loss. Finally, I'll conclude by arguing that the future of insect conservation depends not only on scientific expertise, but on building connections: between people, place and data to lead to action. In an era of rapid environmental change, these connections may be our most powerful tool for understanding and protecting global insect populations.

The Power of Connection: How Participation Creates Meaningful Change

Dr. Erin Roger, Director, Nature, The David Suzuki Foundation

BIO: Erin Roger is the Director for Nature at the David Suzuki Foundation. The goal of the Nature Portfolio is to protect and restore nature by inspiring action and improving policy, using science, Indigenous knowledge, storytelling and engagement. The team works across both terrestrial and marine environments to achieve this goal. Prior to joining the David Suzuki Foundation, Erin worked for the Commonwealth Scientific Industrial Research Organization, where she worked on open science and open data initiatives.



Erin's interest in biodiversity began at Acadia University working on cadmium concentrations in moose. Her Ph.D. was in Ecology looking at how common wombats move around road impacted environments. Erin has also worked in climate change adaptation and is a 2022 Churchill Fellow and a graduate from the Australian Institute of Company Directors. Erin has published articles on topics ranging from semi-arid ecology to community science as well as in online sources such as The Conversation.



Student Presentations - Ph.D.



(9:40 AM - 11:16 AM)

Moderator: Michelle Tseng

- 1. Keep calm and carri-on: Necrophagous insects as indicators of agro-ecosystem health**
Matt Tsuruda, University of British Columbia
- 2. Co-infecting reproductive manipulators of *Trissolcus japonicus***
Joel Bourgeois, University of Victoria, Agriculture and Agri-food Canada
- 3. Wetland pollinator networks in central British Columbia**
Genevieve van der Voort, University of Northern British Columbia



Friday, October 16th cont.

Student Presentations - Ph.D.

4. Characterizing a novel fly-nematode-bacteria system

Maxine Angeley, University of Victoria

5. Assessing the distribution, diversity, and data completeness, of digitized British Columbian Trichoptera occurrence records

Alannah Penno, University of Northern British Columbia

6. Local adaptation impacts overwintering energy drain in larvae of the eastern spruce budworm (*Choristoneura fumiferana*) under fluctuating temperatures

Alexander Coverley, University of British Columbia

7. From data availability to conservation action: Establishing benchmarks for species assessments

Nathan Earley, University of Victoria

8. Following the collapse: predicting suitable endemic mountain pine beetle habitat across Canada

Lucas Peng, University of British Columbia

MORNING BREAK & SNACKS: 11:16 AM - 11:36 AM

Student Presentations - Masters 10 min

(11:36 AM - 12:14 PM)

Moderator: Freya Innes

1. Impacts of adaptive silviculture on pollinator biodiversity in British Columbia's sub-boreal spruce biogeoclimatic zone

Jeffrey Vogt, University of Northern British Columbia

2. The effects of forest management tactics in Northern British Columbia cut blocks on native bee pollinators (Hymenopteran: Apoidea)

Leah Swanson, University of Northern British Columbia





Student Presentations - Masters 10 min cont.

3. Fall conditions during early diapause impact insect cold tolerance and post-diapause fitness

Laura-Anne Browning, University of British Columbia

4. Trap tales: The influence of red alder stand conditions and forest fragmentation on family-level beetle bycatch diversity

Michelle Yim, University of British Columbia



LUNCH BREAK: 12:14 PM - 1:14 PM

Plenary 2 (1:14 PM - 1:44 PM)

Moderator: Michelle Tseng

Local Adaptation in the Eastern Spruce Budworm

Dr. Katie Marshall, Associate Professor, Insect Physiology & Ecology, University of British Columbia

Abstract: Surviving winter requires adaptations to both surviving low temperatures and decreased food supply. Winter is the season that differs most strongly across latitude, and also is the season that is changing most with climate change, yet local adaptation to winter conditions is poorly characterized. The spruce budworm, *Choristoneura fumiferana*, is found across the entire North American boreal forest and is one of its most destructive pest species. There are modelling efforts to predict when and where outbreaks of *C. fumiferana* will occur, but these assume no local adaptation to local conditions. Our lab has been examining how variation in winter conditions across the range leads to local adaptation of both energetics and cold tolerance. We use a variety of approaches, including whole genome sequencing, transcriptomics, common-garden experiments, respirometry and modelling, to understand how local adaptation to winter works in *C. fumiferana*.

BIO: Katie Marshall is an Associate Professor in the Zoology Department at UBC. She did her undergrad at Acadia University before moving to Western for a PhD and then to Wilfrid Laurier and UBC for postdoctoral fellowships. Katie is remarkably and perhaps annoyingly capable in a massively broad range of topics. She can easily flip from community ecology to physiology to all of the 'omics. She'll also fix your HPLC machine while advising on the statistical model you should have used for your binomial data. Katie is most likely to be voted MVP on any Trivia team so you should try to recruit her for Friday's events. Finally, Katie is a cherished collaborator and thesis committee member and as per her website, an expert in filling out forms. This bio was written by Michelle Tseng, the self-proclaimed president of the Katie Marshall Fan Club.



Student Presentations - Masters 10 min cont.

(1:44 PM - 2:20 PM)

Moderator: Erez Büyükyılmaz

6. Can fertilizer rates moderate pest presence and herbivory in an organic production system?

Caelen Watson, University of British Columbia

7. The role of hedgerows in biological control: spotted wing drosophila management in BC agriculture

Lorien Simoes de Paiva, University of British Columbia

8. Oops, I 'Phid It Again: Investigating aphid population trends and biodiversity in BC highbush blueberries from the early 2000s and now

Eva Burghardt, University of British Columbia, Agriculture and Agri-Food Canada



Student Presentations - Masters 5-min

(2:20 PM - 2:55 PM)

Moderator: Freya Innes

- 1. Overstory retention, insect colonization, and wildfire risk in a managed northern British Columbia forest**
Joshua Cherney, University of Northern British Columbia

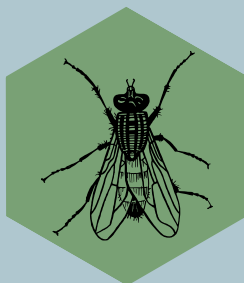
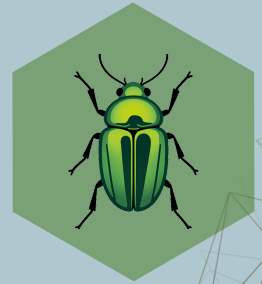
- 2. A Novel Nematode on the Mountain Pine Beetle**
David Furlonger, University of Victoria, Natural Resources Canada

- 3. What Bit Me? Developing a Metabarcoding Protocol for Surveying Mosquito Biodiversity in British Columbia**
Julia Price, University of British Columbia

- 4. Egg-laying behaviour and sensory ecology of a coastal rockpool mosquito (*Aedes togoi*)**
Sarah Garcia, University of British Columbia

- 5. Characterizing geographic variation in Hemlock Woolly Adelgid Cold Tolerance within Canada**
Marcus Lai, University of British Columbia

- 6. Drosophila-Parasitoid Food Web of the Okanagan**
Michelle Ma, University of British Columbia Okanagan



AFTERNOON BREAK: 2:55 PM - 3:15 PM

Professional Presentation - *Virtual*

(3:15 PM - 3:22 PM)

Moderator: Kathleen Furtado

1. Unstructured Sampling Yields High Rove Beetle Diversity (5 min talk)

Justin Chan, University of Victoria

Student Presentations - *Virtual* Masters 10-min

(3:22 PM - 3:46 PM)

Moderator: Kathleen Furtado

1. Forest, fringe, and field: Pest and natural enemy abundance across forage agroecosystems

Meganne Harrison, University of Northern British Columbia

2. Host/pest interactions between *Drosophila suzukii* and *Vaccinium membranaceum* in the Okanagan Valley: Modelling drivers and assessing predictive capability

Nicholas Hivon, University of British Columbia Okanagan, Agriculture and Agri-Food Canada

Student Presentations - *Virtual* Undergraduate 5-min

(3:46 PM - 3:53 PM)

Moderator: Kathleen Furtado

1. Does Forest Canopy have a Significant Effect on Aerially Applied Btk reaching the Forest Understory?

Paige-Marie Stewart, Camosun College

Quick break - 3:53 - 4:05

Friday, October 16th cont.

Student Presentations - Undergraduate 10-min

(4:05 PM - 5:05 PM)

Moderator: Kathleen Furtado

- 1. Fitness consequences of a parasitic nematode infecting mushroom-feeding sphaerocerid flies**
Lawsen Augustowich, University of Victoria

- 2. Leafhopper Phenology in the Okanagan Valley**
Jiamin Bai, Agriculture and Agri-Food Canada

- 3. A “Bury” Big Problem: How burying beetles can act as indicators of ecosystem health in an increasingly fragmented world**
Ada Patton, University of British Columbia

- 4. Predicting Macro-Moths in a Restricted Area using Community Science Data**
Averyl Shifflett, Canadian Forest Service

- 5. Short-term Forecasting of Adult *Aedes albopictus* Density Using a Time-Series Foundation Model**
Lanqi Huang

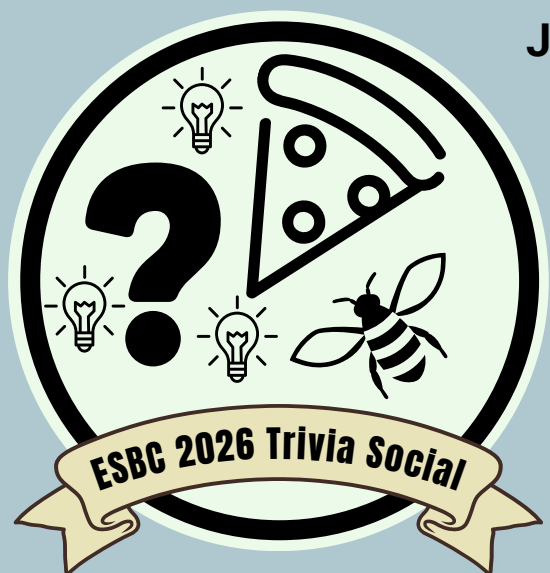
Post-Symposium Mixer

Join us after the first day of presentations for an evening of entomological trivia and pizza!

WHERE: Mixer will take place in the same venue, no need to relocate.

WHEN: Friday, October 16th, 5:30 PM - 7:30 PM

- Purchase drinks at “Friday Beers” down the hall
- \$3 a drink - **cash only**
- Pizza will also be provided





ESBC Conference 2026: CONNECTIONS: DAY 2

Saturday, October 17th



Professional Presentations

(9:00 AM - 11:05 AM)

Moderator: Freya Innes

1. The Timema, first record of an American Stick insect in British Columbia (5 min talk)

Shayden Younker, University of British Columbia

2. Establishment of *Drosophila suzukii* and its adventive parasitoids across an island landscape in the Pacific Northwest of North America

Paul Abram, Agriculture and Agri-Food Canada

3. A putative red alder decline complex and implications for forest management: Case study from a municipal water supply area in southwestern British Columbia

Debra Wertman, University of British Columbia

4. Dytiscus Larvae of Metro Vancouver

Quinlan Wu

5. Evolution and genetics of a selfish X chromosome and its suppressor in a woodland fly

Steve Perlman, University of Victoria

6. Improving management tactics for mealybugs in British Columbia vineyards

Asim Renyard, Agriculture and Agri-Food Canada

7. The herbicide RoundUp negatively affects predator-prey interactions in freshwater invertebrates

Michelle Tseng, University of British Columbia

Saturday, October 17th cont.

Professional Presentations Cont.

8. Better safe than sorry? A discussion on the risks associated with the sale and movement of commercial insects within Canada

Carly McGregor, University of British Columbia

9. Potential of artificial nest boxes to supplement pollination of highbush blueberry.

Sandra Gillespie, University of the Fraser Valley

SYMPOSIUM END & MORNING BREAK: 11:05 AM - 11:25 AM

ANNUAL GENERAL MEETING & CATERED LUNCH 11:25 AM -12:35 PM

END: 12:35 PM (please help tidy up)





STUDENT ORAL PRESENTATION AWARDS

The Entomological Society of British Columbia presents awards for the best student (BSc, MSc, or PhD) oral presentations. For consideration, students must be registered at a post-secondary institution and give a presentation at the Annual General Meeting (AGM). Prizes are awarded at the AGM. The MSc presentation award is known as the James Grant Award. This award is sponsored by the [North Okanagan Naturalist Club](#) and memorializes their founder and first president.

GRADUATE STUDENT SCHOLARSHIP COMPETITION

The Entomological Society of British Columbia awards annually a scholarship of \$1000 to up to two postgraduate students to encourage students engaged in entomological research in BC. For more information on eligibility and how to apply, visit entsocbc.ca/awards-scholarships.

DEXTER JOHNSON AWARD IN INSECT SCIENCE

This is a \$1000 annual award recognizes the best manuscript submitted in any peer-reviewed journal by a student in the field of insect ecology. The award is open to all students (membership in the ESBC is not necessary).

EQUITY, DIVERSITY & INCLUSION AWARD

The Entomological Society of British Columbia annually awards a scholarship of \$1000 to support the participation of one graduate student from a group currently underrepresented within the ESBC. Funds may be used at the student's discretion.





CONNECTIONS: MERGING METHODS, SHARING PERSPECTIVES, AND CONNECTING PEOPLE



List of presenters, coauthors, and abstracts

PLENARY SPEAKERS

Dr. Erin Roger, Director, Nature, The David Suzuki Foundation

Title: The Power of Connection: How Participation Creates Meaningful Change

Abstract: The global decline of insect populations has consequences for biodiversity and ecosystem functioning, while simultaneously offering unprecedented opportunities for public engagement, discovery, and conservation. Reflecting on over fifteen years of working in conservation spanning Australia and Canada, this talk explores how community science, emerging technologies, arts-based engagement, and biodiversity stewardship are transforming our relationship with insects and the landscapes they inhabit. Drawing on examples from my experience working for Australia's national online biodiversity database, I'll discuss efforts to monitor beetles, Bogong moths and the innovative citizen-powered biosecurity alert service. Examples which highlight how public-researcher connections can generate critical knowledge about species decline, distribution, and emerging threats. My work at the David Suzuki Foundation offers complementary lessons. Through initiatives such as Butterflyway Project, and Butterflies in My Back Yard (BIMBY), communities are creating habitats, fostering ecological literacy, and building emotional connections with the species that share our neighbourhoods. I'll conclude by arguing that the future of insect conservation depends not only on scientific expertise, but on building connections: between people, place and data to lead to action. In an era of rapid environmental change, these connections may be our most powerful tool for understanding and protecting global insect populations.

Dr. Katie Marshall, Associate Professor, Insect Physiology & Ecology, University of British Columbia

Title: Local Adaptation in the Eastern Spruce Budworm

Abstract: Surviving winter requires adaptations to both surviving low temperatures and decreased food supply. Winter is the season that differs most strongly across latitude, and also is the season that is changing most with climate change, yet local adaptation to winter conditions is poorly characterized. The spruce budworm, *Choristoneura fumiferana*, is found across the entire North American boreal forest and is one of its most destructive pest species. There are modelling efforts to predict when and where outbreaks of *C. fumiferana* will occur, but these assume no local adaptation to local conditions. Our lab has been examining how variation in winter conditions across the range leads to local adaptation of both energetics and cold tolerance. We use a variety of approaches, including whole genome sequencing, transcriptomics, common-garden experiments, respirometry and modelling, to understand how local adaptation to winter works in *C. fumiferana*.

List of presenters, coauthors, and abstracts, cont.

PHD PRESENTATIONS

Matt Tsuruda (UBC), Juli Carillo (UBC)

Title: Keep calm and carri-on: Necrophagous insects as indicators of agro-ecosystem health

Abstract: Necrophagous insects, which feed on the remains of animals, are vital, often overlooked components of a well-functioning ecosystem. By cycling nutrients, necrophages enrich soil for agricultural use while simultaneously clearing the landscape of potentially disease-causing carrion. Due to their dependence on organisms of upper trophic levels, necrophages are particularly sensitive to disturbances such as habitat loss, pollution, and landscape simplification. This sensitivity, along with their relative abundance and diversity, could make necrophagous insects uniquely effective as bioindicators of ecosystem health. My research project aims to relate necrophagous insect community structure, abundance, and diversity to landscape connectivity and ecosystem functioning in agro-ecosystems. To accomplish this, I have sampled necrophagous insects and their corresponding ecosystem services across a fragmentation gradient on 18 farms across the Fraser Valley. I sampled these insects in different habitats, including forest, edge, and agricultural field, to capture the full breadth of insects present in the landscape. Preliminary results indicate that necrophages respond to microhabitat type in terms of abundance and community composition. While analyses and processing are ongoing, I hope this research will give farmers and scientists an additional method of evaluating ecosystem health while expanding our knowledge of an invaluable and often neglected ecological guild.

Joel Bourgeois (UVic, AAFC), Steve Perlman (UVIC), Paul Abram (AAFC)

Title: Co-infecting reproductive manipulators of *Trissolcus japonicus*

Abstract: Inherited bacterial symbionts are important evolutionary drivers for their arthropod hosts. Most endosymbionts are maternally inherited, and several endosymbionts have evolved mechanisms that manipulate host reproduction to increase their transmission to the next generation. The most common reproductive manipulation is cytoplasmic incompatibility (CI). CI is a reproductive manipulation in which symbiont-free females experience reduced offspring viability when mated with symbiont-infected males. Wolbachia is the best-known CI symbiont, however CI has increasingly been documented in other bacterial taxa. Here we characterize a novel scenario whereby two endosymbiotic bacteria, Wolbachia and Rickettsia, induce CI independently in a haplodiploid host *Trissolcus japonicus*. This represents the first documented case of Rickettsia inducing CI in a haplodiploid host, and the first documented case of Wolbachia and Rickettsia independently inducing CI in the same host. Co-infections of these two symbionts appear to synergistically strengthen CI; however, single infections appear to be bidirectionally incompatible. Our results highlight the growing diversity of CI inducing endosymbionts and the growing body of literature describing multiple reproductive manipulations in the same host species. Finally, the discovery of reproductive manipulation in *Trissolcus japonicus* highlights potential population-level consequences of CI that may be relevant to the global redistribution of this species for biological control.

List of presenters, coauthors, and abstracts, cont.

Genevieve van der Voort (UNBC), Erica LePage (1), Mollie McAdam(1), Leah K. Swanson (1), Jakob Barnes (1), Staffan B Lindgren (1), Elizabeth Elle (2), Jasmine K. Janes (1), Dezene P.W. Huber (1)
1. Faculty of Environment, University of Northern British Columbia (gvan@unbc.ca)
2. Department of Biological Science, Simon Fraser University

Title: Wetland pollinator networks in central British Columbia

Abstract: Wetlands are vital in part because of the ecosystem services they provide and biodiversity they sustain. These habitats support unique insect and plant species adapted to aquatic environments, and unique plant-insect interactions. Pollinator networks have been increasingly used to examine urban and agricultural environments, yet they are rarely characterized in wetland habitats. This is especially true in British Columbia's northern and central interior, despite their utility for understanding plant-pollinator dynamics and guiding conservation decisions. Our objective was to characterise diurnal pollinator networks in lacustrine wetlands and peatlands, in addition to examining wetland insect diversity, in this region of the province. A total of 16 networks were characterised from June to August 2025 near Fort St. James, BC. Over 1,200 potential pollinators were collected from 78 flowering species. Different wetland types and flowering communities show varying levels of connectance and asymmetry. The persistence and conservation of wetland habitats depends on the interactions between their plant and insect species. Our research will add to natural history knowledge and diversity data for these understudied habitats, as well as aid in the preservation of important ecological interactions for more effective biodiversity conservation.

Maxine Angeley (UVic), Dr. Steve Perlman (University of Victoria, Department of Biology and Centre for Forest Biology), Lawsen Augustowich (University of Victoria, Department of Biology and Centre for Forest Biology)

Title: Characterizing a novel fly-nematode-bacteria system

Abstract: While insects are fascinating on their own, they can also contain a hidden world of interactions. Insect parasites occupy tiny niches within their already specialized hosts, and their lifestyles are often supported by highly evolved relationships with bacterial symbionts. These complex, multi-trophic systems are rarely fully characterized. Here, I investigate an undescribed tylenchid nematode that parasitizes mushroom-feeding sphaerocerid flies in British Columbia. This nematode harbours a unique and highly reduced bacterial symbiont, the first Wolbachia reported from an insect-parasitic nematode. I aim to characterize this system by examining the nematode's morphology, life history, interactions with its host, and association with Wolbachia. To do so, I use field collections, manipulation of laboratory cultures, specialized microscopy, genomics, and transcriptomics. Because this system can be maintained in the laboratory, it provides a valuable opportunity to investigate how a highly adapted bacterial symbiosis contributes to the biology of its parasite host. It may also provide insight into other Wolbachia-nematode symbioses, particularly those in vertebrate-parasitic filarial nematodes, which are considerably more difficult to manipulate and have important implications for human health. By examining the insect host, parasite, and symbiont together, this work aims to uncover how these interactions evolve, persist, and shape host biology.

List of presenters, coauthors, and abstracts, cont.

Alannah Penno (UNBC), Dezene Huber (University of Northern British Columbia)

Title: Assessing the distribution, diversity, and data completeness, of digitized British Columbian Trichoptera occurrence records

Abstract: Aquatic insects such as Trichoptera are highly sensitive to changing water conditions, and it is important to understand their past and current distributions in the face of climate change. Conducting new insect collection surveys is important for continually updating our understanding of the natural world, but they can be unfeasible over large geographic areas due to time and cost constraints. These issues can be managed through using existing records, such as those collected through previous research, citizen science efforts, or museum surveys. To be of use for research, these records must contain the key information of taxonomic identification, collection location, and collection date, though may also contain other associated metadata that further contextualizes the records. Though these data can contain valuable information, they must be used with a degree of caution due to potentially being impacted by a number of collection biases. Digitized occurrence records of Trichoptera in British Columbia were sourced from the Global Biodiversity Information Facility (GBIF), a data aggregation platform, to assess the state of these records and to conduct analyses that highlight the value of these data, while also exploring the associated collection biases.

Alexander J. Coverley (UBC), Evan K.G. McKenzie (University of British Columbia), Amanda D. Roe (NRCAN), Katie E. Marshall (University of British Columbia)

Title: Local adaptation impacts overwintering energy drain in larvae of the eastern spruce budworm (*Choristoneura fumiferana*) under fluctuating temperatures.

Abstract: Overwintering environmental temperatures are lower and more variable at higher latitudes potentially affecting energetic drain and phenology. Larvae of the eastern spruce budworm (*Choristoneura fumiferana*) overwinter for 7+ months without feeding, with a latitudinal range extending from the Northwest Territories to Virginia. We tested local adaptation to variable temperatures overwinter, hypothesising that southern populations would exhibit greater metabolic suppression, while northern populations would show reduced thermal sensitivity of metabolism under greater amplitudes of thermal variability. We acclimated overwintering L2 larvae to constant 2°C, or daily cycles of 2±8°C or 2±12°C. Through the winter, we repeatedly measured thermal sensitivity of metabolic rate and 24-hour metabolic rate, and assayed energetic reserves. The southernmost population exhibited greater metabolic suppression, while northern populations exhibited reduced thermal sensitivity in metabolic rate following acclimation to fluctuating temperatures. We then built a biophysical model and found that physiological responses to fluctuating temperatures culminate in a pattern of countergradient variation, with locally adapted populations showing similar overwintering energetic drain in their home ranges. Taken together, we provide evidence that populations of the eastern spruce budworm differ in the physiological responses that reduce overwintering energetic drain, with northern populations exhibiting greater plasticity in response to fluctuating temperatures.

List of presenters, coauthors, and abstracts, cont.

Nathan G. Earley (UVic), John D. Reynolds (Simon Fraser University), Brian M. Starzomski (University of Victoria)

Title: From data availability to conservation action: Establishing benchmarks for species assessments

Abstract: Conservation status assessments prioritize species based on extinction risk and available biological information. Consequently, well-studied, charismatic species (like Monarchs) are often prioritized over understudied ones. For understudied species – including most arthropods – extinction risk is often evaluated using range extent and occupancy, with small ranges indicating greater risk. However, prioritizing species for assessment is challenging, particularly when Data Deficient classifications are considered poor uses of limited conservation funds. Internet-accessible species-occurrence data are increasingly used in status assessments, but how much data is sufficient remains unclear. We used GBIF and iNaturalist records for COSEWIC assessed arthropods to investigate relationships between record numbers and range estimates and identified when species have sufficient data for assessment. We provide empirical benchmarks for sampling sufficiency and found that minimum record requirements varied significantly between taxonomic groups. Combining GBIF and iNaturalist data consistently produced higher estimates of range extent and occupancy than either dataset alone. Our findings demonstrate the complementarity of community science and traditional species-occurrence datasets and highlight the importance of integrating both sources for conservation. Understanding how much occurrence data is enough, alongside which species are most in need of assessment, can help conservation practitioners allocate limited resources more effectively.

Lucas Peng (UBC), Michael Howe (Utah State University), Allan Carroll (the University of British Columbia)

Title: Following the collapse: predicting suitable endemic mountain pine beetle habitat across Canada.

Abstract: The most recent population irruption of mountain pine beetle (*Dendroctonus ponderosae*) dramatically altered the structure and function of pine forests across western North America. Further, beetles breached geoclimatic boundary of the Rocky Mountains, which facilitated the rapid spread of epidemic populations across naïve pine-dominated boreal forests. Beetle populations eventually collapsed in the ‘invaded range’ due to a combination of aggressive management and a dwindling supply of suitable host trees. Following the collapse of epidemic populations, beetles likely persist across the invaded range at low densities in their endemic state, a low-density phase where beetles preferentially attack stressed and suppressed trees. It remains unknown whether there is sufficient host material and forest conditions for beetles to not only persist but potentially irrupt and continue their eastward expansion through Canada's boreal forests. Here, we compiled plot-based and remotely sensed forest inventory data to assess the distribution of potential host material across Canada. We used these spatially explicit data to develop models of stand density index and basal area; key predictors of stand-level host suitability for both endemic and epidemic beetle populations. Results are discussed in the context of data aggregation, processing, and predictive capacity.

List of presenters, coauthors, and abstracts, cont.

MASTERS PRESENTATIONS - 10 MINUTE

Jeffrey Vogt (UNBC), Dezene Huber (UNBC), Celia Boone (Ministry of Forests), Che Elkin (UNBC)

Title: Impacts of adaptive silviculture on pollinator biodiversity in British Columbia's sub-boreal spruce biogeoclimatic zone

Abstract: Insect communities are important in forest ecosystem functioning. Pollination is arguably one of their most critical services as it impacts the flowering, fruiting, and reproduction of many plants. Understanding the effect of silvicultural practices on forest insect pollinator abundance and diversity is important for effective pollinator conservation and sustainable forest ecosystem management. The Adaptive Silviculture for Climate Change (ASCC) research instillation at the John Prince Research Forest (JPRF) is evaluating how forest management can impact the resistance and resilience of forest ecosystems to shifting climatic and environmental conditions. Set in British Columbia's sub-boreal spruce biogeoclimatic zone, we are using this operational scale experiment to test how partial harvest forest operations impact pollinator communities. Pan traps were set in four silviculture treatment blocks that range from low to high overstory retention, and in control blocks. Samples were collected each June from 2023 -2025 to evaluate the impact of climate-adaptive silviculture on insect pollinator communities. While pollinator diversity and abundance fluctuate yearly, both diversity and abundance are higher in harvested treatments. Most treatments show substantial variability, leading to further questions about balancing forest openness and vegetation retention for conserving pollinator communities and ecosystem services.

Leah Swanson (UNBC), Andony Melathopoulos (Oregon State University), Lisa Wood (University of Northern British Columbia), Dezene Huber (University of Northern British Columbia)

Title: The effects of forest management tactics in Northern British Columbia cut blocks on native bee pollinators (Hymenopteran: Apoidea).

Abstract: "Eureka!" wrote Dr. Douglas Baird following field trials of the herbicide active ingredient, glyphosate. Glyphosate-based herbicides (GBH) account for about 72% of active ingredients on the market. The Canadian forest industry uses GBHs following harvest to reduce angiosperm tree growth and improve establishment of replanted conifers. However, herbicide residues may persist for up to 12 years, exposing arthropods that associate with plants such as pollinators. Moreover, in laboratory settings, GBHs show negative impacts on *Apis mellifera* and *Bombus* species. The true impact on bee communities that GBH residues have outside laboratory settings is unknown and must be explored to inform responsible forest management. Over 1,000 pan traps were collected throughout the summers of 2025 and 2026 in six clear-cut blocks that were GBH treated or mechanically brushed (control). Trapping was conducted twice before, once immediately after, and twice one year after treatments. Thirty-nine bee (Hymenoptera: Apoidea) species were identified in and around treatment sites. Results show that in some herbicide treated cut blocks, bee abundance increased one year after herbicide treatment, suggesting that plant composition before treatment may influence bee response after herbicide sprays. Analysis of community level changes in response to treatments is ongoing.

List of presenters, coauthors, and abstracts, cont.

Laura-Anne Browning (UBC), Amanda D. Roe (Canadian Forest Service, Natural Resources Canada, Sault Ste. Marie, ON, Canada), Jantina Toxopeus (Department of Biology, St. Francis Xavier University, Antigonish, NS, Canada), and Katie E. Marshall (Department of Zoology, University of British Columbia, Vancouver, BC, Canada)

Title: Fall conditions during early diapause impact insect cold tolerance and post-diapause fitness

Abstract: Diapause is an essential form of dormancy where many insects greatly reduce their development and stop feeding to conserve energy during the winter season. Often, temperate insect species will initiate diapause before the onset of winter, during the fall, when temperatures are still relatively high. Consequently, an insect's energetic reserves at the beginning of winter can be impacted by the fall conditions they experience. Here, we used the spruce budworm, *Choristoneura fumiferana*, to show how fall conditions impact an insect's ability to tolerate the cold during the winter and their fitness in the spring. Insects, like *C. fumiferana*, convert the energy molecule glycogen into cryoprotectants, that protect against cold damage. We predicted that longer and warmer falls will cause higher energetic drain before winter, leading to reduced cryoprotectant content and lower cold tolerance in the winter. We exposed early diapausing larvae to two fall temperatures (10°C and 20°C) for five different fall durations (1, 2, 4, 5, and 7 weeks). Multiple measurements of midwinter cold tolerance, including supercooling points and glycerol content as well as survival after a mid-winter cold challenge support our prediction that long warm falls negatively impact the ability of *C. fumiferana* to survive the overwintering period.

Michelle Yim (UBC), Sichen Zhou (FIDEL, UBC), Debra Wertman (FIDEL, UBC), Allan Carroll (FIDEL, UBC)

Title: Trap tales: The influence of red alder stand conditions and forest fragmentation on family-level beetle bycatch diversity

Abstract: Red alder, *Alnus rubra*, a nitrogen-fixing tree that supports high invertebrate diversity, is facing bark beetle-associated declines and increasing fragmentation in British Columbia (BC), Canada. Despite these threats, no research has investigated beetle family diversity or its responses to stand conditions and fragmentation in red alder ecosystems. We hypothesized that in these ecosystems, (1) stand conditions influence beetle family diversity through habitat and food availability, and (2) forest fragmentation influences beetle diversity by altering habitat connectivity and patch size. We also evaluated how these factors affect abundances of five beetle families that include scolytine predators. Ethanol-baited multiple-funnel traps targeting ambrosia beetles were deployed in five red alder-dominated forests in southwestern BC in 2024. Beetle bycatch, predominantly saproxylic, was identified to family. Family-level Shannon Diversity Index, richness, and select abundances were associated with stand conditions and fragmentation to varying extents. Higher tree density and dead red alder abundance and lower fragmentation were associated with higher diversity. Structural heterogeneity, including deadwood availability, and forest continuity likely provided microhabitats for saproxylic beetles. Family-level resolution allowed us to explore functional associations of saproxylic beetles to environmental conditions across landscapes. Bycatch offers a valuable resource for biodiversity monitoring and conservation management in red alder forests.

List of presenters, coauthors, and abstracts, cont.

Caelen Watson (UBC), Terisha Bailey (Agriculture and Agri-Food Canada, IPM Lab), Shayden Younker (Synergy Semiochemicals / UBC), Dr. Juli Carrillo (UBC, PLEE Lab)

Title: Can fertilizer rates moderate pest presence and herbivory in an organic production system?

Abstract: Organic vegetable production is a vital component of the the Canadian agricultural sector. Whilst fertilizer is a key component of organic farming, growers often apply it in excess to maximize yields. High applications are more costly to soil health than moderate fertilizer inputs. Excess plant nutrients from fertilizers can affect growth-defense trade-offs and attract insects, leaving them vulnerable to herbivory, which may result in crop loss. There is a lack of research in organic vegetable crop systems on Canadian soil; thus, we can provide unique insight into pest-fertilizer dynamics. In this study, we assessed pest populations and identified herbivory and pests in two organic vegetable fields. Using these data, we will compare pest presence and herbivory level across fertilizer treatments ranging from zero compost to high compost. Our research will inform organic vegetable growing practices by demonstrating how rate and constitution of fertilizer application influences pest pressure on crops. Our findings will be of interest to growers, informing the fertilizer application practice to protect crops against economically important pests.

Lorien Simoes de Paiva (UBC), Carly McGregor (University of British Columbia), Andrew Seiler (University of British Columbia), Juli Carrillo (University of British Columbia)

Title: The role of hedgerows in biological control: spotted wing drosophila management in BC agriculture

Abstract: Parasitoid wasps are beneficial insects which contribute to the management of pest populations, including spotted wing drosophila, a serious global pest of soft fruit and berries. Ecological intensification practices—such as creating habitat to support biological control insects—present an exciting avenue for integrated pest management, potentially reducing pest populations without chemical intervention. In this ongoing study, we aim to assess the role of hedgerows in agricultural systems for supporting parasitoid wasp populations and their biological control services. By quantifying the rate of parasitism in spotted wing drosophila across habitat features and landscape gradients, we will report trends in parasitoid abundance and biological control effectiveness. The findings of this study will provide critical insight into how to better promote parasitoid wasps and their biological control services, informing sustainable agricultural praxis and pest management strategies across the province.

List of presenters, coauthors, and abstracts, cont.

Eva Burghardt (UBC, AAFC), Dr Juli Carrillo (University of British Columbia), Dr Michelle Franklin (Agriculture and Agri-Food Canada), Dr Bryan Brunet (Agriculture and Agri-Food Canada)

Title: Oops, I 'Phid It Again: Investigating aphid population trends and biodiversity in BC highbush blueberries from the early 2000s and now

Abstract: Aphids, the soft-bodied phloem feeders causing dismay to growers and gardeners alike, are of major concern to highbush blueberry production in the Lower Mainland of British Columbia. This is in large part due to their transmission of Blueberry Scorch Virus (BScV), which can necessitate the removal of infected plants. Acquisition of BScV takes mere seconds of probing by a visiting aphid, meaning that even non-blueberry aphids are of concern to growers. Agriculture and Agri-food Canada (AAFC) researcher Dave Raworth conducted several surveys into the biodiversity of aphids in the early 2000s, but with a new profile of pesticides, increased pressure from invasive species, and the ongoing spread of blueberry scorch virus, updated information is needed on the changing biodiversity of aphid species frequenting blueberry plants in BC. My project seeks to update our current knowledge of aphid biodiversity and population trends in highbush blueberries. Analysis of aphid biodiversity and population dynamics is ongoing, and my presentation aims to provide an early discussion of patterns, changes, and risk levels given the aphid species being identified now compared to two decades ago.

Virtual: Meganne K. Harrison (UNBC), Wim Van Herk (Agriculture and Agri-Food Canada) , Jasmine K. Janes (University of Northern British Columbia), Dezene P.W Huber (University of Northern British Columbia)

Title: Forest, fringe, and field: Pest and natural enemy abundance across forage agroecosystems

Abstract: Forage agroecosystems within the central interior of British Columbia have previously been understudied for arthropod pests and their natural enemies. Producers and pest managers often lack the knowledge of which pests and natural enemies are present within their landscape. This information can be important for mitigating pest damage and yield loss, particularly in years with poor growing seasons, as the presence of natural enemies within fields and in adjacent forested areas may allow the development of novel IPM tactics and strategies for pest managers. To address this knowledge gap, we completed arthropod surveys over a ~ 600km corridor along BC Highway 16 in summer 2022. We sampled 14 sites (forage fields and the adjacent edges and forests) using pitfall traps. Species of interest for producers (pests, predators, parasitoids) were sorted and identified. We further explored relationships between these species and landscape variables, including the forest-edge-to-field-size ratio and plant richness, which may be influenced through farm and landscape management. These results provide insight into the distribution of some of the arthropod pests and natural enemies found across forage agroecosystems in the central interior of British Columbia, to inform and improve IPM systems for producers in the region.

List of presenters, coauthors, and abstracts, cont.

Virtual: Nicholas Hivon (UBCO, AAFC), Jason Pither (University of British Columbia Okanagan), Chandra Moffatt (Agriculture and Agri-Food Canada)

Title: Host/pest interactions between *Drosophila suzukii* and *Vaccinium membranaceum* in the Okanagan Valley: Modelling drivers and assessing predictive capability

Abstract: *Drosophila suzukii* (spotted wing drosophila, SWD) is an invasive vinegar fly which oviposits in ripe and ripening soft-skinned fruits, causing wide-spread economic damage. There is a large body of literature reporting laboratory- and crop-based research; however, ecology outside of commercial agriculture is comparatively understudied. We monitored SWD populations and harvested fruits from a culturally important Indigenous food species *Vaccinium membranaceum* (huckleberry) at 20 sites along an elevation gradient over several years, with the goal of understanding the drivers of population dynamics and infestation such as overwintering and reinfestation. We assembled predictors from the literature, including winter climatic conditions, seasonality, and prior population pressure, and fit mixed-effects models to assess their contributions to the population dynamics of SWD and subsequent huckleberry infestation. We assessed out-of-sample predictive performance using leave-one-out and temporal blocking cross-validation structures. We found that heat accumulation accounts for 92% of the variance explained by the infestation model ($R^2 = 0.74$ of 0.80 total), while population dynamics show complex associations with heat accumulation, elevation and seasonality ($R^2 = 0.82$). Cross-validation results show a 33% reduction in infestation MAE vs. null (intercept-only), and up to 17% reduction in abundance MAE vs. null. Between-year variation introduced substantial challenges in the predictive modelling of both population and infestation dynamics. Future predictive modelling should include improved climate projections and a longer-term training dataset.

List of presenters, coauthors, and abstracts, cont.

MASTERS PRESENTATIONS - 5-MINUTE

Joshua Cherney (UNBC), Ché Elkin (UNBC), Dezene Huber (UNBC)

Title: Overstory retention, insect colonization, and wildfire risk in a managed northern British Columbia forest

Abstract: Northern British Columbia has a rich history of logging and silviculture. Increasing global temperatures and the shifting of historic wildfire regimes in boreal and sub-boreal forests have called the sustainability of historic forest management strategies into question. This has prompted the development of novel silviculture approaches to create fire resilient stands. The Adaptive Silviculture for Climate Change (ASCC) network has implemented an innovative approach consisting of variable overstory retention within the John Prince Research Forest, with 20 sites and a gradient of management goals associated with climate resilience. We measured the volume and moisture content of coarse ground fuel and described the rate of decay of observed deadwood. Funnel traps were set up to trap for ecologically and economically important bark, ambrosia, and wood-boring beetles to understand the saproxylic beetle community post-intervention. We will investigate the trade-offs and synergies to managing forest fuel load as wildfire fuel and insect habitat. We will model the relationship between beetle distribution, diversity, and deadwood moisture content to view how insects are modifying coarse woody debris flammability and affecting post-harvest climate resilience.

David Furlonger (UVic, NRC) Dr. Qing Yu (Agriculture and Agri-Food Canada Ottawa), Greg D. Smith (Natural Resources Canada, Canadian Forest Service, Pacific Forestry Centre), Steve J. Perlman (Department of Biology and Centre for Forest Biology, University of Victoria), Dr. Katherine P. Bleiker (Natural Resources Canada, Canadian Forest Service, Pacific Forestry Centre)

Title: A Novel Nematode on the Mountain Pine Beetle

Abstract: The Mountain Pine Beetle (*Dendroctonus ponderosae*) harbours a diverse community of internal and external organisms, including mites, fungi, parasites, bacteria, and nematodes. Despite extensive research on this ecologically and economically important bark beetle, many of its associates remain poorly characterized. Here, we describe a new species of nematode in the genus *Bursaphelenchus*, herein *Bursaphelenchus ponderosae* sp. nov. This nematode is an external, phoretic, mycetophagous species that associates in a unique location beneath the beetle's hindwing in the jugal fold—a small membranous flap. This nematode is morphologically distinct from other closely related taxa by the absence of a bursal flap. Additionally, *Bursaphelenchus ponderosae* sp. nov. exhibits feeding dimorphism, with a predatory form observed in older nematode lab cultures. Phylogenetic relationship analyses are based on multiple ribosomal genetic markers, small subunit SSU 18S and large subunit LSU 28S, helping place this new nematode amongst other described *Bursaphelenchus* nematodes in the group *abietinus*.

List of presenters, coauthors, and abstracts, cont.

Julia Price (UBC), Dr Benjamin Matthews (UBC Zoology), Sarah Garcia (UBC Zoology)

Title: What Bit Me? Developing a Metabarcoding Protocol for Surveying Mosquito Biodiversity in British Columbia

Abstract: British Columbia's approximately 50 recorded mosquito species have been periodically updated through literature compilation and targeted surveillance (Belton 1983; Peach 2018), but sampling efforts remain geographically uneven. Species identification has relied on traditional methods, which are limited by taxonomic expertise and several cryptic species complexes (*Culex* and *Anopheles*). With ongoing concern around the spread of invasive mosquito species, there is value in additional methods to update the species list and improve our understanding of mosquito distributions across the province. This project aims to address this gap through development and application of a DNA metabarcoding protocol to identify mosquito species from bulk samples submitted by citizen scientists across British Columbia and the Yukon.

Utilizing BOLD, NCBI, and in-house database-derived reference sequences for the expected species, we have conducted an in-silico assessment of COI and ITS2 primer resolution, identifying where multi-locus barcoding will potentially identify closely related taxa where single locus cannot. In parallel, protocol validation on known composition mock pools demonstrated high sensitivity to minority species within a mixed pool, independently confirmed by both markers.

This talk will present the development and validation of the metabarcoding protocol to date, as the work moves towards application on the citizen scientist collection.

Sarah Garcia (UBC), Benjamin Matthews (UBC)

Title: Egg-laying behaviour and sensory ecology of a coastal rockpool mosquito (*Aedes togoi*)

Abstract: Mosquitoes typically prefer to lay eggs in and around freshwater because high salinity pools can be lethal to their aquatic offspring. Some species, however, have adapted to laying eggs in saline water. *Aedes togoi*, the coastal rockpool mosquito, readily lays eggs in and around concentrated seawater pools in Southeast Asia and the Pacific Northwest. Their larvae are adapted to frequent fluctuation of salinity, temperature, and volume in these pools. Salt is a potent aversive egg-laying cue in widespread disease vectors, like the yellow fever mosquito *Aedes aegypti*. Using quantitative behavioral assays and transcriptomic approaches, I aim to address the following questions:

- 1) What components of seawater are attractive to *Ae. togoi* when egg-laying?
 - 2) What components of seawater are aversive to *Ae. togoi* when egg-laying?
 - 3) What sensory appendages and molecular receptors do they use to sense these components?
- This will lay the groundwork for the future investigation of molecular mechanisms underlying this resilient mosquito's behaviour and create opportunities for comparison with related disease vectors. If shared mechanisms are identified, this work could shed light on how mosquitoes of greater public health risk lay eggs and why few mosquito species are fit to live in saline environments

List of presenters, coauthors, and abstracts, cont.

Marcus Lai (UBC), Katie E. Marshall (UBC), Alexandra Hardcastle (UBC), Chris JK MacQuarrie (Natural Resources Canada, Canadian Forest Service)

Title: Characterizing geographic variation in Hemlock Woolly Adelgid Cold Tolerance within Canada

Abstract: Hemlock Woolly Adelgids (HWA) are a species of semi-native insects in western North America. On the west coast, local Hemlock trees are suspected to have co-evolved with HWA, leading to greater host resistance to the pest. A new, distinct lineage from East Asia has invaded eastern North America, where it acts as a significant defoliator of eastern hemlock trees. The northern range of HWA is suspected to be limited by its cold tolerance; however, with global warming, this range is expected to expand. Our research focuses on understanding the cold tolerance of HWA, particularly looking into the differences between the eastern and western populations. If there is a difference in cold tolerance between the two populations, we're interested in looking at the mechanisms behind this difference. To do this, we aim to determine the supercooling points (SCP) of HWA, the temperature at which internal body fluids freeze. Supercooling points of HWA vary across time. The supercooling points of HWA are lower during winter compared to fall and spring. On average, HWA in BC had a significantly higher average SCP compared to eastern HWA. Our results provide insights into HWA survivability and range expansion in Canada.

Michelle Ma (UBC, AAFC), Dr. Chandra Moffat (AAFC), Christine Cock (AAFC), Tyler Nelson (AAFC)

Title: Drosophila-Parasitoid Food Web of the Okanagan

Abstract: *Drosophila suzukii* (spotted wing drosophila) is a challenging and abundant pest in the Okanagan valley. *D. suzukii* eggs are laid in soft-fleshed fruit, and their larvae continue development inside of the fruit. As a result, most pest management strategies are unable to target *D. suzukii* early in development as the fruit acts as a shield. Parasitoids of *D. suzukii* have the potential to act as a solution for this problem. *Leptopilina japonica* is an adventive parasitoid that parasitises *D. suzukii* larvae. *L. japonica*'s arrival in the Okanagan has been anticipated since its detection in the Lower Mainland in 2016, and the first specimen was collected in the Okanagan in 2025. *L. japonica* can parasitize various species of *Drosophila*, but have a strong preference for *D. suzukii* as a host. How *L. japonica* will affect the local *Drosophila* species, both directly and indirectly, is not known. As *L. japonica* is expected to establish and increase in population in the next few years, questions arise about how it will interact with existing larval parasitoids and how it affects the local *Drosophila*-parasitoid food web.

List of presenters, coauthors, and abstracts, cont.

UNDERGRADUATE PRESENTATIONS - 10-MINUTE

Lawsen Augustowich (UVic), Maxine Angeley (Department of Biology and Centre for Forest Biology, University of Victoria), Dr. Steve Perlman (Department of Biology and Centre for Forest Biology, University of Victoria)

Title: Fitness consequences of a parasitic nematode infecting mushroom-feeding sphaerocerid flies

Abstract: The nematode parasites of mushroom-feeding flies are an exciting system that illustrates the complexity of host-parasite associations and their potential to shape individual life history and alter host ecology. The recent discovery of an undescribed *Howardula* sp. that infects the genus *Spelobia* (Sphaeroceridae) provides an opportunity to broaden work in this class of host-parasite interactions. Here, we quantify the fitness effects of the infection in the parthenogenetic fly *Spelobia parapusio*, an introduced species in North America, under controlled laboratory conditions. Infection significantly reduced adult survival, with infected individuals experiencing an approximately 16-fold increase in mortality risk relative to uninfected controls. Among infected individuals, lifespan was negatively correlated with higher parasite load, despite some heavily infected individuals surviving for relatively extended periods. Infection also reduced average adult emergence ~5-fold, although emergence timing and overall developmental trajectories did not differ between treatment groups. These results demonstrate strong parasite-driven fitness costs, potentially across multiple life stages, with infection intensity playing an important role in determining host survival. Overall, this study highlights a novel host-parasite system, providing a foundation for our understanding of how infection shapes host fitness in an asexual and invasive species.

List of presenters, coauthors, and abstracts, cont.

Jiamin Bai (AAFC)

Title: Leafhopper Phenology in the Okanagan Valley

Abstract: The Virginia creeper leafhopper, *Erythroneura ziczac*, is a significant invasive pest of wine grapes in Western North America. Leafhopper phenology data is valuable in informing the timing of control practices used by growers but is currently lacking. However, collecting life stage data of leafhoppers currently comprises gathering grapes leaves and quantifying insect stages by an observer under a microscope – a labor-intensive process. Additionally, samples spoil quickly, necessitating more efficient methods. Digital image processing tools (e.g. FIJI) may be the solution to allow for high throughput leafhopper phenology data collection, but a standard method of image capture must be developed before automation tools can be applied. This project investigates the usage of flatbed scanners as one method of image collection and evaluates the accuracy of leafhopper egg counting in FIJI with that of traditional light microscopy. Preliminary data indicates that use of a flatbed scanner may be suitable for leafhopper life stage capture, although some refinements must occur to the process before it can be adapted for automation.

Ada Patton(UBC), Matt Tsuruda (UBC), Juli Carrillo (UBC)

Title: A “Bury” Big Problem: How burying beetles can act as indicators of ecosystem health in an increasingly fragmented world.

Abstract: Land use change and habitat fragmentation are some of the main drivers of insect declines worldwide. While fragmentation has been associated with increased insect body size and decreased abundance, reductions in habitat area and edge effects may also drive some of these patterns. This may also depend on target taxa, and relatively little is known about how fragmentation influences body size and abundance for burying beetles (Staphylinidae). Burying beetles function as indicators of ecosystem health due to their sensitivity to anthropogenic change and play an important role as decomposers of carrion. Here, I will review my study on how burying beetles respond to fragmentation (habitat edge density). Over the summer of 2025, we measured how beetle size and abundance changed between crop field, field margin, and forest habitats across the Lower Vancouver Mainland. Forest habitats had significantly higher beetle abundance than crop fields, with field margins falling between the two. Beetles collected in field and margin habitats were marginally larger than those collected in forest habitats. These patterns may have been caused by competition, food resource abundance, or temperature effects. This study emphasizes that more research will be crucial to better understand the underlying causes and significance of these changes.

List of presenters, coauthors, and abstracts, cont.

Averyl Shifflett (Canadian Forest Service - Pacific Forestry Centre), Brian Van Hezewijk
(Canadian Forest Service - Pacific Forestry Centre)

Title: Predicting Macro-Moths in a Restricted Area using Community Science Data

Abstract: Moths are an important part of the forest community and can be used as an indicator of forest health. However, sampling the moth community in a forest is time-consuming, expensive and requires specialized knowledge. This study aimed to determine if community science data (from iNaturalist observations) could be used to predict the community of macro-moths in an under-sampled area restricted to public access. To do this, we surveyed the community of macro-moths using standardized light traps, run each night for 7 weeks, within three Douglas-fir stands in the Coastal Western Hemlock BEC Zone. Predictive models were generated using iNaturalist records from the surrounding area and incorporated factors such as distance, ecological similarity, season, and observation year. Overall, 96 identifiable taxa and 2841 moths were captured in the light-trap survey with moderate levels of similarity between sites. In general, models incorporating records from larger areas (<20km), only during the sampling season, all BEC zones, and all years, generated the best predictions. However, even the best models did not have high levels of accuracy. Our study suggests that community science data should be used to complement, rather than replace, structured insect surveys.

Lanqi Huang (School of Geographic Sciences, East China Normal University); Liyuan Liu (School of Geographic Sciences, East China Normal University); Shenjun Yao (Key Laboratory of Geographic Information Science, Ministry of Education; School of Geographic Sciences, East China Normal University)

Title: Short-term Forecasting of Adult *Aedes albopictus* Density Using a Time-Series Foundation Model

Abstract: Short-term forecasting of adult *Aedes albopictus* density can provide valuable lead time for urban mosquito surveillance and targeted vector control. However, routine surveillance data are often sparse and spatially heterogeneous, while mosquito abundance is influenced by meteorological conditions, habitat characteristics, and socio-economic factors. These challenges can limit the effectiveness of conventional forecasting approaches. This study developed and evaluated a time-series foundation model framework for multi-step forecasting of adult *Aedes albopictus* density indices using surveillance data collected across Shanghai, China, in 2024. Hourly meteorological observations were aggregated to the dekad scale and spatially matched to mosquito monitoring sites using inverse distance weighting. Habitat type and socio-economic variables were additionally incorporated as covariates. Chronos-2 was evaluated for 1- to 4-dekad-ahead forecasting under two configurations: a covariate-informed model incorporating environmental and urban variables, and a covariate-free model using surveillance records alone. Both configurations were evaluated using rolling backtesting and compared with exponential smoothing (ETS), XGBoost, and Random Forest models. Model performance was assessed using mean absolute error (MAE), root mean squared error (RMSE), and Spearman rank correlation. For the representative one-dekad-ahead forecast, the covariate-informed Chronos-2 model achieved an MAE of approximately 6.576 and an RMSE of 15.083, compared with 6.661 and 15.529, respectively, for the covariate-free Chronos-2 model. ETS remained competitive in terms of RMSE. Notably, the covariate-informed Chronos-2 model achieved the highest Spearman rank correlation with observed mosquito density (approximately 0.704), indicating improved ability to reproduce mosquito abundance patterns. These findings demonstrate the potential of time-series foundation models for multi-step forecasting of *Aedes albopictus* density using routine surveillance data. Integrating environmental and urban covariates may improve the identification of sites and periods with elevated mosquito abundance, providing a practical basis for proactive surveillance, site prioritization, and more timely allocation of vector-control resources.

List of presenters, coauthors, and abstracts, cont.

UNDERGRADUATE PRESENTATIONS - 5-MINUTE

Virtual: Paige-Marie Stewart (Camosun College), Brian VanHezewijk (Natural Resources Canada)

Title: Phenology of Hemlock Woolly Adelgids (*Adelges tsugae*) in the Lower Mainland

Abstract: Aerial application of Btk is used to target pests such as Spongy Moth. In some cases, these sprays fail to completely eradicate infestations. Dense canopy may be preventing the penetration to the understory where caterpillars feed. The objective of this study was to measure the relative amount of spray deposition between treatment areas with varying amounts of canopy cover. As part of an operational spongy moth eradication program, spray droplet cards were set out in three treatment areas (forest, field, and residential streets) to measure droplet deposition during three separate Btk applications. The cards were photographed and the volume of droplets measured per square centimeter. Percent canopy cover was photographed and measured for the forest and residential treatment areas. Treatment area had a significant effect on the deposition rate, though this effect was inconsistent between applications. The canopy cover had a statistically significant, negative effect on deposition rate, looking at the forest and street treatment areas only. This effect was consistent over all three applications. Based on the results, it appears that forest canopy does significantly reduce deposition rates, but further study is necessary to determine if this reduction is enough to prevent successful eradication of targeted pests

List of presenters, coauthors, and abstracts, cont.

PROFESSIONAL PRESENTATIONS

Shayden Younker (UBC), Carly McGregor (Plant-Insect Ecology & Evolution Lab and University of British Columbia), Juli Carrillo (Plant-Insect Ecology & Evolution Lab and University of British Columbia)

Title: The Timema, first record of an American Stick insect in British Columbia

Abstract: This summer we recorded the first sightings of a Timema stick insect species in British Columbia. Timema are a genus of stick insect found on the west coast of the United States. They are mostly found in California with populations stretching into neighboring states and into Mexico. We found two individuals at the UBC Farm during sampling for other insects, and a community member found a third individual. We collected a fourth individual on a coast redwood during targeted sampling. We only observed females and it may be possible that this is one of the parthenogenic species found in the United States, Timema douglasi. Collected individuals fed upon both Douglas Fir and Coast Redwood, and samples have been retained for DNA sequencing. After the initial observations we started a monitoring trial at the UBC Farm and the UBC Botanical Garden to assess whether more of these insects have become established here, and if so to what extent. While we did not find any other individuals beyond our first observations, we have developed a monitoring program that can be continued next spring.

Paul K. Abram (AAFC), Elizabeth H. Beers, Charlie C. Coslor, Benjamin Diehl, Michelle T. Franklin, Louis B. Nottingham, Jason Thiessen, Matthew Tsuruda, Juli Carrillo

Title: Establishment of *Drosophila suzukii* and its adventive parasitoids across an island landscape in the Pacific Northwest of North America

Abstract: Island biogeography theory predicts that consumers, especially specialists, should establish less readily on islands than their resources. Islands, as semi-independent units varying in size and isolation, could be valuable natural testbeds for biological control of insect pests by their natural enemies. In 2022 and 2023, we surveyed the invasive *Drosophila suzukii* and its adventive parasitoid wasps, *Leptopilina japonica* and *Ganaspis kimorum*, from wild blackberries at 58 sites across the mainland, Vancouver Island, and 12 Gulf and San Juan Islands. *Drosophila suzukii* was present on every island. Parasitoids were detected on only five islands, and only the less specialized parasitoid species (*L. japonica*) was found on islands. Parasitoid presence was positively associated with host density and island area, but not with ferry vehicle traffic, suggesting propagule pressure may not be limiting. *Drosophila suzukii* densities were actually higher, not lower, on islands where parasitoids were detected. Our results suggest that host density and specialization are associated with natural enemy spread to islands, but parasitoid establishment does not guarantee pest suppression, at least over the short term.

List of presenters, coauthors, and abstracts, cont.

Debra Wertman (UBC); Allan Carroll (Department of Forest and Conservation Sciences, University of British Columbia)

Title: A putative red alder decline complex and implications for forest management: Case study from a municipal water supply area in southwestern British Columbia

Abstract: Riparian and early seral ecosystems in the Pacific Northwest of North America are dominated by red alder, *Alnus rubra*, an ecologically important, nitrogen-fixing hardwood tree species. Our recent work suggests that a scolytine beetle–fungus complex, consisting of the alder bark beetle, *Alniphagus aspericollis* and its pathogenic symbiote *Neonectria bordenii*, ambrosia beetles, and *Armillaria* fungi is contributing to the decline of red alder throughout southwestern British Columbia (BC), Canada. We chose to investigate putative red alder decline within the Greater Victoria Water Supply Area (GVWSA; southern Vancouver Island, BC), a protected, Douglas-fir dominated watershed. We installed 20 400m² fixed-area plots throughout the > 20,000 ha GVWSA in summer 2025 (reassessed 2026) to quantify red alder conditions across the landscape and rates of alder bark beetle population increase. These ground plot data were used to calibrate a red alder decline map for the GVWSA, generated using vegetation inventory data and spectral signatures derived from a 2025 orthophoto. This decline layer, and ground plot data on rates of alder bark beetle population increase, will be integrated with environmental data to construct an alder bark beetle susceptibility model for red alder within the GVWSA that will inform future forest management and watershed protection.

Quinlan Wu

Title: Dytiscus Larvae of Metro Vancouver

Abstract: Six species of predaceous diving beetles (Dytiscidae) in the genus *Dytiscus* have been recorded within the Metro Vancouver Regional District (MVRD)—*D. dauricus*, *D. circumcinctus* (both of which are only known in the MVRD from single specimens in the Spencer Entomological Collection), *D. cordieri*, *D. harrisii*, *D. hatchi*, and *D. marginicollis*. While the larval morphology of *D. cordieri* and *D. dauricus* have been only briefly described, the other four species recorded in MVRD lack larval descriptions altogether. Through this project under the ESBC's Special Projects Grant, breeding populations of four of these species were located within Metro Vancouver. Larvae were successfully collected and reared to adulthood to confirm their species, and their morphology was described and their behaviour was observed both in-situ and in a laboratory setting. Through these descriptions, a dichotomous key was created for identification of the larvae of these four species. Rounding out the project with a third field season, more behaviours were observed, interesting outliers are noted, more figures were made, and a manuscript is nearly complete.

List of presenters, coauthors, and abstracts, cont.

Steve Perlman (UVic)

Title: Evolution and genetics of a selfish X chromosome and its suppressor in a woodland fly

Abstract: Selfish genetic elements break the rules of Mendelian inheritance to bias their transmission, often at the expense of the fitness of the organism. Although they are widespread and thought to play important roles in shaping organismal evolution, they are largely understudied because they are often not associated with an obvious phenotype and/or because their effects can be suppressed by other parts of the genome. We have been characterizing a selfish X chromosome in the woodland mushroom-feeding fly, *Drosophila testacea*. Males that carry this selfish X chromosome produce almost only female offspring. This is because a still unknown gene product targets and destroys sperm that carry a Y chromosome. We have also found segregating genetic variation that suppresses the action of the selfish X chromosome, recovering more balanced offspring sex ratios, and in this talk, we will summarize our recent progress on characterizing the evolution and genetics shaping conflict between the selfish X chromosome and its suppressor.

Asim Renyard (AAFC); Andrea Brauner (Agriculture and Agri-Food Canada); Jay Nelson (Agriculture and Agri-Food Canada)

Title: Improving management tactics for mealybugs in British Columbia vineyards

Abstract: Mealybugs are highly damaging pests of wine grapes. Mealybug feeding transmits grapevine leafroll viruses, which are incurable infections that reduce vine productivity, and their honeydew excretions contaminate grape clusters. The lifecycle of mealybugs are cryptic, largely taking place under vine bark, which challenges management efforts. Growers currently rely on broad spectrum systemic insecticides but phenological and spatial knowledge could inform more targeted management tactics, such as horticulture oils. In British Columbia, mealybugs belonging to the genus *Pseudococcus* are the primary vectors for leafroll virus, yet information on their phenological and seasonal movements is limited. To improve mealybug management our objectives are to: 1) characterize mealybug phenology and seasonal movements; 2) map mealybug and virus-infected plant spatial distributions; and 3) test new spray tactics for mealybug control. Ongoing phenological data collection indicates two peaks of mealybug activity in early and late summer. Preliminary vineyard mapping shows mealybug spatial distributions are patchy and do not correlate with infection status in plants. Lab experiments testing horticultural oils showed high mortality rates in mealybugs. Together these findings can inform the basis for improved mealybug control.

List of presenters, coauthors, and abstracts, cont.

Michelle Tseng (UBC), 2026 UBC Insect Ecology class

Title: The herbicide RoundUp negatively affects predator-prey interactions in freshwater invertebrates

Abstract: Insect predators are fundamental components of food webs but they are disappearing due to habitat loss and insecticides. Studies now demonstrate that plant herbicides can also be toxic to insects and other invertebrates. The herbicide glyphosate is the most used pesticide on the planet with RoundUp (RU) the most commonly used formulation. Although some studies have reported negative effects of RU on individual invertebrate species, little is known about how it affects species interactions. We conducted a laboratory experiment to investigate the effects of RU exposure on predator-prey interactions between the phantom midge (*Chaoborus americanus*) and the zooplankton *Daphnia pulex*. Because RU is applied throughout the year, we also examined whether temperature altered the effects of RU exposure. We found that the effect of RU on predator-prey interactions was affected by temperature. The combination of 8°C and low RU concentration (0.3mg/L) reduced prey consumption by the predator and allowed *Daphnia* to persist. However, at 12° and 16°C, predator foraging rate was not affected by RU exposure. Our study demonstrates that even low concentrations of RU can alter predator-prey interactions. Given the widespread use of RU, we advocate for a more comprehensive understanding of its non-target effects on global food webs.

Carly McGregor (UBC), Juli Carrillo (UBC)

Title: Better safe than sorry? A discussion on the risks associated with the sale and movement of commercial insects within Canada

Abstract: Commercial insects, such as beneficial insects used for biological control and pollination, provide important services to agricultural producers and may reduce reliance on pesticide products. However, the sale and movement of commercial insects from outside their documented range into new parts of the country (e.g., from the East coast to the West coast) can have unintended consequences. This includes the release and establishment of these commercial insects into natural areas outside their range, with potential repercussions for native insects and plants. We present on potential and known benefits and risks associated with the sale and movement of commercial insects within Canada, consider case studies of novel insect introductions into BC, and invite discussions from the ESBC community on benefits and risks associated with the current status quo.

List of presenters, coauthors, and abstracts, cont.

Sandra Gillespie (University of the Fraser Valley), Emma Bryce (University of the Fraser Valley)

Title: Potential of artificial nest boxes to supplement pollination of highbush blueberry.

Abstract: Commercial highbush blueberry growers use managed honey bees (*Apis mellifera*) as the primary pollination strategy, yet bumblebees (*Bombus* spp. L) are more efficient pollinators of blueberry flowers. Studies on the use of nest boxes to augment wild bumblebee populations are limited and have focused solely on nest box occupation, without determining whether there is any subsequent increase in bumblebee visitation to flowers in the field. We evaluated the use of nest boxes in commercial blueberry production systems across 12 field sites in the Fraser Valley of British Columbia (BC), Canada, measuring nest box occupation and the rate of bumblebee visitation to flowers. Box occupation was low (10% in 2022 and 18% in 2023), with occupation rates related to surrounding land-use in semi-natural habitat. This relationship varied between years, suggesting that local and seasonal factors may mediate landscape-level effects. Sites with occupied nest boxes showed significantly higher in-field bumblebee visitation rates in 2023, a year in which overall bumblebee abundance was notably lower. These findings suggest that nest boxes have potential as a tool for mitigating pollination deficits in commercial blueberry production, particularly in years of low wild pollinator abundance.

Virtual: Justin Chan (UVic), Nathan G. Earley (University of Victoria), Elora Adamson (University of Victoria), John D. Reynolds (Simon Fraser University), Brian M. Starzomski (University of Victoria)

Title: Unstructured Sampling Yields High Rove Beetle Diversity

Abstract: Unstructured sampling during the 2026 BC Biodiversity Program field season, yielded a high diversity of Rove Beetle (Coleoptera: Staphylinidae) species throughout the province. From April through August, a team of naturalists surveyed Provincial Parks and Protected Areas of British Columbia, with a focus on those with little or no iNaturalist data. The collaborative and unstructured sampling structure allowed a wide variety of taxa to be surveyed, across a variety of habitats, including the coast, old-growth forest, and sub-alpine. I focused on invertebrates and recorded 203 observations of Staphylinids, with 50 identified to species, and another 16 at genus level. The subfamily Aleocharinae, was a collection focus of mine due to the difficult dissections required, available literature and sheer diversity of species. There are 227 species recorded of the subfamily in BC alone, and 24 Aleocharinae species were identified during the field season. Overall, I found 8 new Staphylinid species that have never been recorded on iNaturalist, 4 new species on iNaturalist for Canada, and 7 new species on iNaturalist for British Columbia. *Dinaraea worki*, previously known from Alberta and Quebec, is a new provincial record for British Columbia.

A thank you to the organizing committee!

Michelle Tseng, Asim Renyard, Adam Blake, Yonathan Uriel, Freya Innes, Emmanuel Hung and Kathleen Furtado.