WESTERN UNIVERSITY BIOLOGY

ALUMNI NEWSLETTER

FALL 2024

Wandering Albatross Chick, Marion Island
Photo credit: Brent Sinclair

Western Science

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About the cover: Marion Island is a South African territory in the sub-Antarctic. According to Dr. Brent Sinclair the interesting thing is not the Wandering Albatross Chick but the fact "that the nest will have *Pringleophaga marioni* caterpillars in it"

CHAIR'S REPORT

A MESSAGE FROM DAVID COLTMAN

Welcome to the Fall 2024 Western Biology Alumni Newsletter. This issue is brimming with stories about the people from Western Biology who make a difference in the world. These include Dr. Natasha MacBean, a recent addition to our academic staff, and a clearly rising international star studying the impacts of climate and environmental change on terrestrial ecosystems. We also bid farewell and best wishes to Dr. Brent Sinclair, who is leaving Western for a chair in insect physiology at Cornell University, which is also host to one of the world's top entomology departments, where he will be happily surrounded by "insect people". We are grateful for Brent's outstanding contributions to Biology teaching, research and service, and he leaves big shoes to fill.

Western Biology also recently bid a final farewell to two of our most prominent, prolific, engaged and impactful academic staff, Professors Jeremy McNeil and Keith Hobson. Jeremy and Keith were world-leading experts in their fields and they are sorely missed. Many of you will have been fortunate to have been taught, mentored or influenced by Jeremy or Keith, and witnessed their tireless commitment to understanding and conserving the natural world for future generations.

On a brighter note – this issue profiles two alumni who are making a better world through biology. Dr. Liam McGuire (PhD Biology, '12) reflects on how the collaborative training and research environment he experienced at Western during his PhD facilitated his growth and helped feed his curiosity. Liam is now an Associate Professor of Biology at Waterloo. Katherine Butts (MSc Biology '06) shares her remarkable journey in which her experience in Western Biology helped springboard her to a career in marine biology, as she is now a fisheries biologist with the Lax Kw'alaams Band in BC.

We also highlight a range of impactful contributions that Western Biology students and faculty have recently made. I look forward to hearing great things in the future from our newest alumni – the Class of '24 medalists and award-winners. And we also feature the award-winning contributions Western Biology's Dr. Paul Mensink has made through applying augmented reality to create truly immersive learning experiences that enable students to swim with virtual sharks and witness plastic marine pollution up close – all from the classroom.

David Coltman
Professor and Chair,
Department of Biology
Western University

Comings and Goings

WELCOME NEW FACULTY: MEET DR. NATASHA MACBEAN, WHO JOINED THE DEPARTMENT IN FALL 2022

By Justin To, MSc Candidate

"You only usually see the successes that people have, but behind that there's a whole 'alternative' CV of failures or things that didn't work out."

How climate change is impacting our weather is becoming increasingly unpredictable every year, and the effects on ecosystems and carbon cycling are still unclear. Luckily, we have Dr. Natasha MacBean to offer her expertise on what to expect. Professor MacBean joined the Department of Biology as an Assistant Professor in Fall 2022 and is globally renowned for her work in modelling the impacts of human activity and climate change on biogeochemical cycles.

Professor MacBean completed her undergraduate degree at the University of Oxford, where she developed an interest in researching climate change. She went on to complete an MESci degree at Oxford, specializing in remote sensing work, and later pursued a PhD at University College London. During her PhD, she focused on identifying uncertainties in existing carbon cycle models, particularly modelling methane production in managed peatlands. She collaborated with various carbon

cycle scientists, examining carbon cycling interactions with vegetation, climate impacts, CO_2 emissions and land use changes.

This research continued in her post-doctoral work at the Laboratoire des Sciences du Climat et de l'Environnment (LSCE) in France, where she studied global carbon cycling using land surface and Earth system models, following the footsteps of one of her inspiring figures: Piers Sellers. Afterwards, Professor MacBean completed a postdoctoral fellowship at the University of Arizona. In 2018 she joined the Department of Geography at Indiana University as an Assistant Professor, before finally arriving at Western in 2022.

Professor MacBean maintains ongoing collaborations with former colleagues across the world to model the impacts and solutions for mitigating climate change. While she enjoyed

her time at a national lab working with highly specialized colleagues focused on a common objective, Professor MacBean still celebrates the university experience and highlights that the academic environment enabled her to explore a diversity of perspectives and opinions – especially from students – and these have helped greatly in her understanding of her own work.

To all the aspiring scientists here at Western, Professor MacBean has this piece of advice: "Do not feel the need to have everything planned out. There will be many unexpected twists, but that does not mean you won't be successful. You may discover new directions that end up being the best thing for you. Working longer hours is often not the answer! A good work-life balance is important for your well-being and will help you to work more effectively and accomplish the successes you hope to achieve."

FAREWELL: WISHING BRENT SINCLAIR THE BEST OF LUCK IN HIS NEXT ENDEAVOURS

Having joined Biology at Western in 2006, via New Zealand, South Africa and Las Vegas, Dr. Brent Sinclair is on the move again to Cornell University, in Ithaca, New York. Dr. Sinclair took up the Sarkaria Professorship in Insect Physiology in the Department of Entomology in September 2024. Dr. Sinclair is excited for his next adventure, particularly being surrounded by fellow "insect people", the hundreds of waterfalls in the surrounding area, and, of course, the promise of cold and snowy winters... for both his research (cold survival in insects) and opportunities for skiing.

When reflecting on his time at Western, Brent remarked on the breadth of students he has interacted with over the years...many of whom stop him in airports to say hello and chat. He is grateful for the supportive and collegial environment in the department, which allowed him to grow as both a person and a scientist.

While in Biology at Western, Dr. Sinclair trained numerous graduate and undergraduate students, many of whom have gone on to academic careers in Canada, the United States and beyond. The impact of his time at Western will be felt for many years to come. We wish you well in your next adventure!

Biology Alumni Profiles

LIAM MCQUIRE
PhD '12

By Hossein Asgari, PhD Candidate

Hailing from Ottawa, Dr. McGuire's academic journey began at Carleton University, where he initially pursued a degree in Engineering. However, after realizing that engineering was not his passion, he made a pivotal decision to switch to Biology. "I didn't know exactly what I was going to do post-graduation, but I knew it had to be something I was passionate about," he reflected.

After completing a BSc in Biology, Dr. McGuire gained invaluable experience working at a biotech company specializing in cellulose ethanol production. His role as a research associate allowed him to hone his lab techniques, but he soon discovered that his curiosity was not fully satisfied within the confines of corporate research. "I wanted to be the one driving the research questions," he noted, which ultimately led him to pursue graduate studies for greater academic freedom.

Dr. McGuire emphasized the importance of learning to ask and answer questions during undergraduate studies. "One of the most important skills is to gather information and synthesize it to further your understanding," he advised current students. He encourages them to be proactive in seeking opportunities, stressing the importance of networking and making meaningful connections in their fields.

A key moment in Dr. McGuire's academic career was participating in the Ontario Universities Program in Field Biology (OUPFB), where he took a field course on the behavioural ecology of bats, led by Dr. Brock Fenton. This experience solidified his desire to pursue a career in research and led to his PhD project on the ecophysiology of bat migration at Western University, under the guidance of Dr. Chris Guglielmo and Dr. Brock Fenton.

Photo credit: Dr. Brock Fenton

After earning his PhD in 2012, Dr. McGuire was awarded an NSERC fellowship and conducted postdoctoral studies at the University of Winnipeg, focusing on the physiology of hibernating bats in relation to wildlife disease. In 2014, he took a position as an assistant professor at Texas Tech University before moving to the University of Waterloo in 2020.

Describing a typical day in his lab, Dr. McGuire shared that no two days are alike. His responsibilities encompass teaching, research, fieldwork, and data analysis. He expressed a deep appreciation for the collaborative nature of research, stating, "I've always had more questions than I could pursue on my own. With my research group, we can tackle many different questions together."

As Dr. McGuire concluded the interview, he highlighted the collaborative environment of the Biology department at Western University, which played a crucial role in his development as an early-career researcher. His journey serves as an inspiring reminder of the power of curiosity and the importance of following one's passion in the pursuit of knowledge.

I thank Dr. McGuire for sharing his journey with us and for continuing to inspire future generations of biologists.

KATHERINE BUTTS MSc '06

By Carson Mitchell, MSc Candidate

Katherine Butts' journey is a testament to the power of passion and perseverance. At 20, a family vacation to British Columbia ignited her love for marine biology after a life-changing encounter with a killer whale.

Today, she fulfills that dream as a Senior Fisheries Biologist, making significant contributions to marine conservation and her community.

Despite the expectation to follow a more traditional path, Katherine knew she wanted something different. After high school, she started her own beautician business, enjoying the work but feeling something was missing. When a fire destroyed her business, she took it as a sign to pursue a new adventure—one that led her back to school and ultimately to her true passion: marine biology.

Determined to make a change, Katherine returned to high school to improve her grades in math and science. At 28, she was accepted into Western University for her undergraduate degree. Though the transition was challenging, she quickly learned to thrive. One of her professors, Marc-André Lachance, taught her a lesson that stayed with her: "You don't have to be brilliant to be good; you just have to work hard." This lesson became a guiding principle for her, reminding her that success comes from effort and perseverance, not perfection.

After earning her Master's degree, Katherine built a diverse portfolio of work experience that prepared her for her current role. Starting out as an at-sea observer off the coast of BC, she gathered DNA and observational data to report to the Department of Fisheries and Oceans. She later returned to Ontario, working as a research associate at London Health Sciences Centre, assessing kidney function in those affected by the 2000 Walkerton *E.coli* outbreak. Once that project finished, she spent nearly a decade as a consultant, conducting biological sampling and fieldwork. Though she longed to return to the West Coast, family obligations kept her anchored in Ontario, where she struggled to find work aligned with her passion for marine life.

Several years later, Katherine made the bold decision to pursue her dream. Determined to work with fish, she flew to BC for interviews and, in 2017, accepted a position as Senior Fisheries Biologist with the Lax Kw'alaams First Nation. In this role, she leads a dedicated team of biologists and technicians, working to strengthen the community's connection to marine life while promoting the health of both the people and the environment.

Katherine is currently leading two major projects. The first focuses on the threat of microplastics in fish tissue and the broader marine ecosystem. Microplastics pose a serious risk not only to marine life but also to the health of First Nations individuals, who rely on marine resources as dietary staples. Her goal is to uncover the full impact of microplastics on marine life, ecosystems, and the people who depend on them.

In addition to this research, Katherine is spearheading the reintroduction of fish traps, an ancient but efficient fishing method. Fish traps work by creating an entry into a closed man-made estuary, where fish swim in, become trapped, and remain unharmed until harvested or released. Although fish traps were banned by the government due to concerns about overfishing, they offer significant advantages: reducing stress and tissue damage in fish, eliminating bycatch, and allowing fishers to selectively harvest based on type, size, and sex, aiding population management. With the fishing industry facing economic challenges and youth discouraged from entering due to high costs and risks, Katherine's reintroduction of fish traps offers a sustainable and accessible solution. Her innovative approach not only benefits fish populations but also supports the community's future. Katherine's efforts are creating lasting change, not just for the environment, but for the people who depend on it.

Katherine Butts' contributions extend far beyond her scientific achievements. Through her relentless dedication, she has not only advanced marine conservation but also strengthened the cultural and environmental foundations of her community. By bridging the gap between traditional knowledge and cutting-edge science, Katherine is fostering a deeper understanding of how we can protect both our marine ecosystems and the people who rely on them. Her work is a testament to the transformative power of passion, and her efforts are paving the way for future generations to safeguard the natural world. Katherine's legacy is one of resilience, innovation, and a profound connection to both the environment and the community she serves—one that will continue to inspire and empower for years to come.

Biology @ Western...Impact

THE IMPACT OF OUR STUDENTS AND FACULTY EXTENDS BEYOND THE GATES OF WESTERN. HERE ARE A FEW RECENT EXAMPLES OF HOW BIOLOGY @ WESTERN IS MAKING A DIFFERENCE:

Recycling...moving the dial on sustainability at Western

Katarina Kukolji , BSc, 2020

Katarina's passion for sustainability and conservation led her to apply for and receive funding form the Western Sustainable Impact Fund to expand recycling efforts across campus. Her initiatives include snack wrappers (such as chip bags, granola bar wrappers, candy packages, resealable plastic bags and blister packs for gum). The response from the campus community has been overwhelmingly positive.

Humans...the most fearsome predators

Dr. Liana Zanette and colleagues are expanding their research on how wildlife worldwide fears human's, the 'super predator,' more than any other predator. Taking her work to Australia, where there are no naturally occurring large carnivorous predators (like lions, bears, cougars or wolves), Dr. Zanette has shown that kangaroos, wallabies and other marsupials fear the human 'super predator' far more than dogs, or the Tazmanian devil.

Keeping track of animals on the move

Drs. Chris Guglielmo and Yolanda Morbey, from the Centre for Animals on the Move, recently acquired funding to expand Motus, a global wildlife tracking system. While Motus already tracks birds and bats in the air, this new funding will allow it to also monitor insects on the ground and fish in rivers. Motus currently tracks over 30,000 animals across 30 countries, and this latest funding will expand that capability.

Nature-based solutions to flooding

Flooding due to severe rainfall events is becoming more frequent, with parts of Ontario experiencing flash floods in May of this year. Brendon Samuels (PhD Candidate) provided insight into how nature-based solutions have the potential to promote flood resilience, often at a fraction of the cost of more traditional manufactured solutions.

Mercury Poisoning near Grassy Narrows First Nation

A recent study by Dr. Brain Branfireun and his team shows that wastewater from a nearby pulp and paper mill is exacerbatinge mercury contamination in the English-Waibagoon River system. This river was heavily contaminated with mercury in the 1960's and 1970's. Although the wastewater itself does not contain mercury, it does contain sulfates and organic material that feed bacteria in the river. These bacteria convert existing mercury into methylmercury, a toxic form that easily enters the food chain. This contamination poses a threat to the Grassy Narrows First Nation, whose members depend on fish from this river system.

Congratulations, New Alumni

WESTERN GOLD MEDALISTS, JUNE 2024

Ella Sottosanti

Helen I Battle Medal and Scholarship in Zoology

Arianna Mancini

Honours Specialization in Animal Behaviour

Sherwin Shertkat-Mahichian

Honours Specialization in Genetics

"I am currently in the process of applying to dental school for 2025-2026. In this next year while applying, I hope to explore the ever-expanding field of genetics and see what the industry has to offer."

Gabriella Simonelli

Donald B. McMillan Honours Thesis Award

"I am starting a Master of Management of Applied Sciences at Western this fall 2024, where I will get the opportunity to do a co-op placement in a healthcare setting. As well, I am applying to medical schools in hopes of attending afterward."

Lauren Breslin

Honours Specialization in Genetics & Biochemistry

"I am currently taking the summer off before I start medical school at Queen's University in the fall! I have wanted to be a doctor for as long as I can remember, and I am excited to continue on that path."

Jordan Smith

Florence Bucke Graduate Scholarship

"Upon graduation, I started a full-time job at Sylvite Agri-Services as an Agronomy Solutions Service Representative. In September 2024, I plan to start my M.Sc. in Environmental Sciences at the University of Guelph. For the duration of my Master's degree, I will be both a full-time employee and a full-time student. I always look forward to meeting new people, learning new things, and making a positive difference."

Hannah Lye

Honours Specialization in Synthetic Biology

"In the Fall, I am starting a Master's in Molecular and Cellular Biology at the University of Guelph in the lab of Dr. Yang Xu. My thesis will focus on identifying and characterising lipases in the marine algae Nannochloropsis oceania. This work will promote metabolic engineering of this species and support its use in biotechnology applications, such as biofuel production."

Julia Guzman

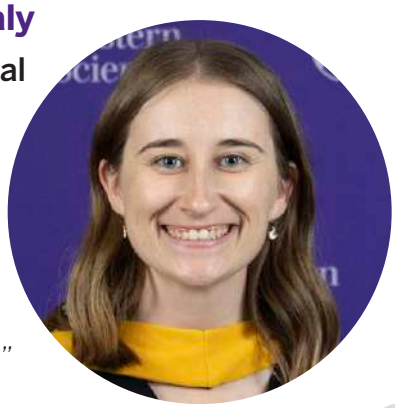
Honours Specialization in Biodiversity & Conservation

"I'm currently working as a Research Assistant on a sustainable agriculture project at the Ivey Centre for Building Sustainable value, and I plan to start a post-graduate program in 2025!"

Rachel Saly

Terence Laverty Memorial Gold Medal

Honours Specialization in Biology



"I am attending Western's Teacher Education program to become a high school biology and math teacher. I am excited to share my passion for these subjects and to create an inclusive and engaging classroom for my future students!"

Award Winning Faculty

PAUL MENSINK: 2023-2024 WESTERN AWARD FOR INNOVATIONS IN TECHNOLOGY-ENHANCED TEACHING

Professor Paul Mensink has been recognized for his groundbreaking work in using augmented reality (AR) to create immersive learning experiences for students. His innovative teaching techniques allow students to "swim with sharks," explore coral reefs, and investigate the impacts of invasive species and plastic pollution, all from the classroom. By blending AR with traditional learning methods, Mensink is helping students experience biology in new, engaging ways.

For more on Professor Mensink's teaching innovations, hear Paul Mensing's virtual Science Talk **here.**

Making an Impact

ALUMNI, JOIN OUR DONOR FAMILY AND HELP MAKE A DIFFERENCE

As you will see in this newsletter, Biology has seen many exciting developments in research and student experience and your support plays a pivotal role in these advancements.

But there is so much more we can do! With new projects on the horizon, additional funding is crucial to fuel innovations that could lead to a deeper understanding of biodiversity, sustainable solutions, food security and animal migration to name a few.

Your contributions—whether one-time gifts or sustained pledges—directly empower our researchers to explore, discover, and make a lasting impact. Donations support student experiential learning through such initiatives as field schools and through scholarships and bursaries.

Please consider supporting us in any way you can, from financial contributions to spreading the word about our mission.

As Western University moves toward launching a new fundraising campaign, we will soon be unveiling priority projects to support the work being done in the Department of Biology. We will provide more information on those exciting projects soon.

In the meantime, please consider supporting one of the following initiatives:

John S. Millar Field Course Award

Prepare biology students for future careers in areas such as conservation, research, ecology and botany. Learning in the field is critical to student success, and donor generosity makes it possible. Your gift helps students apply knowledge gained in the classroom and gain skills employers value in their new hires.

Bursary in Science for Equity, Diversity and Inclusion

Be a champion of equity, diversity and inclusion in science. Your gift supports an annual bursary for students in financial need who are members of equity deserving groups including but not limited to Indigenous, Black, persons of colour, persons with disabilities, women and members of the LGBTQ2+ community.

To make a gift, please visit the following website:

https://www.giving.westernu.ca/where-to-give/faculties/science/

Together, we can drive forward the future of biology and make a difference for generations to come.

Thank you for being a part of this journey with us!

Paula L. Luchak
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Photo credit: Mitch Zimmer

Biology Department through the years ... a 21 Jump Peek

The Faculty and Staff of the Biology Department in 2002

Photo credit: Alan Noon

The Faculty and Staff of the Biology Department in 2023

Photo credit: Mitch Zimmer