

# School of Environment, Resources and Sustainability

## FY 2022 Annual Report

(May 2022 – April 2023)



One of the SERS teams on Campus Clean-Up Day April 21, 2023. Left to right: Asst Prof Helena Shilomboleni, Admin Manager Mary Anne Hardy, Prof & Director Simon Courtenay, MES grad Mark Saunders, Asst Prof Chantel Markle, Asst Prof Felicitas Egunyu. Photo credit: Patricia Huynh PhD student & UW Sustainability Office

## **FY 2022 Report from the School of Environment, Resources & Sustainability for the Special Meeting of the Environment Faculty Council, May 17, 2023**

During Fiscal Year (FY) 2022 (i.e., May 2022- April 2023 comprising the Spring 2022, Fall 2022 and Winter 2023 Terms) SERS faculty taught 47 undergraduate courses with a total enrollment of 2281 students. In Fall 2022 we took in 78 new first year students and between June and October convocations, we graduated 77 students. The total number of active undergraduate students in SERS during our most recently completed term, Winter 2023, was 321 including 81 Honours students and 240 Honours Co-op students.

In addition, 10 graduate courses were taught with a total enrollment of 63 students. In fall 2022 we admitted 6 new PhD students and 9 Masters students. Nineteen students graduated with 9 PhDs and 10 MES. We have offers out to 9 new PhD students and 17 new master's students for Fall 2023. In total SERS has approximately 47 PhD students and 36 MES students who are currently active.

FY 2022 was a year of growth for SERS with the conclusion of our 7 year Cyclic Academic Review and the hiring of five new members.

Our Academic Review for the 2014-2020 period began in Fall 2020 and culminated in responses from SERS and the Dean to recommendations from external reviewers in the Winter term of 2023. These responses provide SERS with a clear plan and measurable targets to address the constructive and helpful suggestions of the reviewers and the exercise leaves SERS in a very strong position with clear direction. In particular, we took this opportunity to rewrite our SERS learning outcomes, indicators and measures which will be the basis of a review of our curriculum.

SERS' long-serving and excellent Office Administrator Jenn Nicholson moved to our larger sister unit SEED in May 2022. While we were very sorry to see Jenn go, we are grateful she is still nearby. We feel very lucky to have been able to welcome Mary Anne Hardy as our new Administrator in August 2022. Mary Anne comes to SERS from the Water Institute on campus where a number of us had worked with her on the Collaborative Water Program. In less than a year, Mary Anne has made herself indispensable in SERS.

Through the strong leadership of first Bruce Frayne and then Johanna Wandel, we were able to attract three first class faculty colleagues through the Black Excellence Hiring process. Felicitas Egunyu joined us in August 2022 to provide backfilling for our Environmental and Sustainability Assessment diploma program as Simon Courtenay prepares to retire and Bob Gibson scales back to half-time. Former SERS student Helena Shilomboleni returned as an Assistant Professor in September 2022 to augment our strength in agriculture and food security (joint appointment with GEM). We look forward to welcoming Leah Jones-Crank in July 2023 to replace Sarah Wolfe and strengthen SERS in collaborative governance within the food-energy-water nexus for improved management, governance and decision-making of the integrated resource system. Finally, we feel very lucky to have been able to attract wildlife ecologist Chantel Markle whose interdisciplinary research program will attract students interested in the spatiotemporal effects of climate change disturbances on the resilience and vulnerability of threatened wildlife and their habitats (joint appointment with GEM).

These five brilliant people arriving just as we engage a new cycle in SERS places us in a very strong position for growth and innovation.

## Some Student highlights for FY 2022:

Emma Kirke (4<sup>th</sup> year) attended the 15<sup>th</sup> meeting of the COP to the UN Convention on Biodiversity in Montréal in December 2022 as a youth delegate. She prepared a SERS [Stories blog post](#) about the experience.

The Sustainability Office's annual Eco-Summit held in October 2022 included a student panel where two of the three panelists were ERS undergraduate students. Shreya Rao (2<sup>nd</sup> year), also a Sustainability Commissioner with WUSA, and Ceileigh McAllister (3<sup>rd</sup> year), also co-chair, Sustainability Literacy Initiative National Youth Coordinator, SDSN Canada, provided insights into the student experience and the engagement of SERS students. A SERS [news story](#) provides additional information.

Sriranjini Raman (4<sup>th</sup> year) was selected as among the Top 25 Under 25 Environmentalists 2022 by The Starfish Canada. She was recognized for her role as the creator of the climate literacy programs, Nurture and Pluriversity, which empowers youth to take charge of their communities. A SERS [news story](#) provides additional information.

## Scholarship Awardees included:

### OGS:

- Emma Collette
- Kira Cooper
- Weltha Grant
- Kyle Schang
- Natasha Serrao
- Maya Basdeo
- Katie Pita
- Nayadeth Arriagada

### CGS-M SSHRC:

- Alexandra Maclsaac

### NSERC Doctoral:

- Jason Phoenix

### Vanier Canada Graduate Scholarship:

- [Nathanael Bergbusch](#)

## Some Faculty highlights for FY 2022:

### Jennifer Clapp:

- Elected as an International Fellow, Swedish Royal Academy of Agriculture and Forestry, fall 2022
- Selected for a second two-year term as a member of the High Level Panel of Experts on Food Security and Nutrition of the UN Committee on World Food Security
- Selected as member of the Scientific Advisory Committee of the UN Food Systems Coordination Hub, fall 2022 (one of 33 experts on this international scientific panel)

### Dustin Garrick

- Appointment as University Research Chair in Water and Development Policy
- Reappointment as member of the Global Water Partnership (GWP), Technical Committee

- Appointment as Senior Advisory to the UN for its 2024 World Water Development Report; delegate to 2023 UN Water Conference for Waterloo, NEWAVE and GWP delegations
- Launch of [Blue Range Labs](#), a research group and impact lab
- Lead edited (Environmental Research Letters) and co-edited (Conservation Science and Practice) special issues on “Markets and the Commons” and “Conservation Philanthropy” respectively

Bob Gibson:

- Sustainability assessment work (both the 2005 book and the 2006 journal paper) featured in International Association for Impact Assessment 2021 conference special session on “Hits of the 21st century for Smartening Impact Assessment”

Kelsey Leonard

- Jarislowsky Fellow, Global Engagement Seminar, University of Waterloo
- Selected as Nautica 2022 Wavemaker for science and research on Ocean protection
- Reappointment to the Great Lakes Water Quality Board of the International Joint Commission (IJC)
- Continued service as the co-chair and lead author for the Water Resources Chapter of the New York Climate Impact Assessment
- Continued service as a chapter author for the U.S. Fifth National Climate Assessment Tribes and Indigenous Peoples chapter
- In February 2023 the WAMPUM Lab celebrated the opening of our co-curated Water Messages exhibit at the MARKK Museum in Hamburg, Germany, featuring our research on Indigenous water governance and conservation.

Brendon Larson

- Faculty of Environment Outstanding Performance Award (2021)

Chantel Markle:

- Accepted the invitation to serve on the Animal Care Committee as an Aquatic/Field expert for a 1-year period.

Steve Murphy

- UN Lifetime Award for Collaboration and Service in Restoration Ecology in 2022.

Maren Oelbermann

- Editor’s Choice Manuscript: Canadian Journal of Soil Science for Biochar in temperate soils: opportunities and challenges. Lévesque, V, Zaidi, N., Oelbermann, M. 2022. Canadian Journal of Soil Science).
- 2021 Associate Editor Excellence Award: Journal of Environmental Quality (\$200) (received in spring of 2022)

Stephen Quilley

- Invited to give keynote speech at International Figurations Conference in honour of Professor Joop Goudsblom, University of Amsterdam
- March 2022: Invited to three-year appointment on the Senate of Our Lady’s Seat of Wisdom University College, Ontario.

Andrew Trant

- Nominated for the Royal Society of Canada College of New Scholars, Artists, and Scientists (results pending)



### Derek Armitage

My 2022 annual report ended with the hope I would make it to an ocean... mission accomplished thanks to a trip to St. John's (Newfoundland and Labrador) for the Small-Scale Fisheries Congress and a cold swim in the Pacific while visiting Vancouver. Research activities over the past year are keeping the ocean and coastal theme alive. I am focused on implementing the SSHRC-funded partnership grant, "Vulnerability to Viability (V2V) Global Partnership for Small-Scale Fisheries" (<https://www.v2vglobalpartnership.org/>) in close collaboration with my colleague Prateep Nayak. Our first full in-person project team meeting will take place in Puri, India in August and will include over 70 V2V participants (country co-ordinators, working group leads and graduate students). The project meeting will be followed by an intensive field school in the Chilika Lagoon with students from UWaterloo, as well as across the region (e.g., India, Bangladesh, Indonesia and Malaysia) and from our partner countries in Africa (e.g., Ghana, Nigeria, Malawi and Tanzania). Beyond the V2V project, much of my research time is centred on the development of ecosystem-based management efforts in Haida Gwaii, and this now includes a recent initiative with Dan McCarthy (along with other great collaborators inside and outside of SERS) to develop a systems/holistic framework to assess the benefits of the Gwaii Haanas National Park Reserve, National Marine Conservation Area, and Haida Heritage Site. The on-going work in Haida Gwaii is supported through a new contribution agreement with Parks Canada along with a SSHRC Insight Development Grant.

I am honoured to work with wonderful graduate students and they continue to make great contributions: Madu Galappaththi defended her dissertation on gender and dried fish value chains in Sri Lanka with flying colours and has gone on to do some exciting post-doc work. Others are proceeding rapidly to defense over the coming months: Anita Lazurko (co-supervised with Vanessa Schweizer) on sustainability transitions, ambiguity and water scenarios; Ella-Kari Muhl on knowledge co-production and ecosystem-based management in Haida Gwaii; Maria Battaglia on small-scale fisheries collective action in Italy; and Lowine Hill (co-supervised with Jeremy Pittman) on natural disasters and intersectionality in the Caribbean. Most of my writing initiatives of late have been led by graduate students and I greatly enjoy collaborating with them in this role. I have also been involved in several fun writing projects with colleagues on themes like co-management of natural resources in Canada (with Trevor Swerdfager), fisheries governance (with Jennifer Silver, Guelph), disrupting governance approaches to biodiversity conservation (with Anne Salomon, SFU and Dan Okamoto, Florida State), and contributing in some small ways to a book project to coincide with the 10 year anniversary of the FAO Voluntary Guidelines for Securing Sustainable Small-Scale Fisheries (led by Fikret Berkes, Manitoba and colleagues at the Food and Agriculture Organization).

Finally, I remain active in several advisory roles, including with the Independent Science Panel for New Zealand's Sustainable Seas National Science Challenge (<https://www.sustainableseaschallenge.co.nz/>). The Sustainable Seas Challenge is moving towards a formal conclusion after 10 years and there is lots to learn from this initiative. I have continued my role on the Scientific Steering Committee for the Integrated Marine Biosphere Research (<https://imber.info/>), a large global research project which focuses on ocean sustainability in the context of global change. And most recently, I was asked to serve on the Strategic Advisory Board for the UN Decade for Ocean for Ocean Sciences (UNDOS) endorsed *Fisheries Strategies for a Changing Ocean and Resilient Ecosystems by 2030 (FishSCORE)*. The past six months have also included some consulting work for Fisheries and Oceans Canada on the development of monitoring indicators for the non-ecological dimensions of Oceans Act marine protected areas.

## Christine Barbeau

A return to a more “normal” academic year has allowed me to get back into the classroom and engage with our wonderful Environment students. Teaching ERS 100 in the Fall and then ENVS 200 in the Winter terms, allowed me the opportunity to get to know our first year SERS cohort. They are passionate, determined, and curious – I am looking forward to seeing them grow and flourish as they continue their academic journeys in SERS and within the Faculty of Environment.

January 2023 began my position as Associate Director of Undergrad within SERS. I faced a learning curve stepping into this role, but the opportunity to become more involved with the strategic initiatives of our school and the background “happenings” of the undergraduate world, has been both challenging but also very rewarding. This position has broadened my understanding of curriculum development, the inner workings of our school and faculty, all while offering the opportunity to think strategically on our undergraduate program with my SERS colleagues.

My role as the Faculty of Environment’s Teaching Fellow has been exciting. The role has evolved over 2022/2023 to move from a project-based focus, towards playing a more strategic role – linking University level initiatives and ideas, with senior level administration and our Environment Faculty. As the faculty’s teaching fellow, I have become the faculty’s representative on such initiatives as the student course perception surveys, the distinguished teaching awards, and the student experience survey committee. One of the larger strategic initiatives that I have focused on, has been the new AODA recommendations. With support from Christine Zara, one of the University’s Workplace Accessibility Specialists and some engaged SERS students, I have begun an accessibility audit of my first year ERS 100 course to determine, based on the new AODA recommendations, how well the course has met the newly proposed guidelines. Based on these findings and knowledge gained from this process, my hope is to facilitate some workshops for ENV instructors who would like to discuss some of the AODA recommendations, key findings from the audit and the potential implications in their courses. Another key initiative that I have begun working on is the Peer Review of Teaching (PRT) process. Through engagement with the other Teaching Fellows and the University’s Teaching Assessment Process office, a trial PRT approach based on the Teaching Effectiveness Framework, has begun. Feedback gained from this process, will help to inform the development of draft guidelines for the faculty’s PRT process.

Finally in September, two master’s students, Beth Grant and Emma Collette, co-supervised by Sarah Wolfe and myself, joined SERS to begin their research looking at the affective load of concepts, objectives, and pedagogical approaches associated with interdisciplinary environmental studies and science. They have made exciting progress with their research, and I am looking forward to seeing the applications of their findings in the development of an educator’s guide.

2022-23 has been an exciting year as we emerged into the world again as the pandemic eased. I was happy to return to some travel in relation to my international policy work. Here is a quick overview of some what I was up to this past year:

- Two of my PhD students successfully defended their dissertations in Fall 2022- Richard Giles in SERS and Lucy Hinton in Global Governance (Environment). Yay and congratulations to both!
- I continued in my role as Vice-Chair of the [High Level Panel of Experts on Food Security and Nutrition](#) of the UN Committee on World Food Security. We returned to in person meetings and I travelled to Rome twice, including for the Committee on World Food Security meeting in October where I got to present to government delegates on HLPE-FSN work (photo below). I also travelled to Ethiopia for HLPE work.
- I was elected to [the Swedish Royal Academy of Agriculture and Forestry](#), which is a great honour, and travelled to Stockholm for the fancy ceremony (on the same steps where they hand out Nobel prizes!) (photo below)
- 2022 was the final year of my Killam Research Fellowship, and when I wasn't doing international policy work, I was working on my book on corporate concentration in food systems and its consequences. I now have now written 11 of the chapters. So happy it is almost complete!
- I continued my work with the [International Panel of Experts on Sustainable Food Systems](#) (IPES-Food) and was a coauthor on two reports this year – one on the [food security implications of the war in Ukraine](#) and one on the linkages between [debt and food systems](#).
- I was appointed as an inaugural member of the new [Scientific Advisory Committee](#) of the UN Food Systems Coordination Hub and looking forward to serving in that capacity.
- I've given tons of talks this past year and lots of media engagement around the current global food crisis – including an interview with BBC, *Le Monde*, and other news outlets.
- I pushed articles in a range of outlets on a range of topics, from legitimacy in [science-policy interfaces](#) (*Nature Food*) to the [food crisis](#) (*Journal of Peasant Studies*) to the [role of finance in climate adaptation](#) (*Current Opinions in Environmental Sustainability*).



Delivery remarks at the Committee on World Food Security, October 2022



With the other new international fellows of the Swedish Royal Academy of Agriculture and Forestry, Jan 2023

**RESEARCH GROUP:** I welcomed two new graduate students to SERS in Fall 2022: Aaliah Carlos, PhD Student, and Ida Harkness, MES student. MAGG Student Ty Sorenson and MES-Water Student Chloé St. Amand are both in the advanced stages of their respective Master's research projects. BA Honours Thesis student Care Rumer has just completed their undergraduate thesis!

**TEACHING:** 2022-23 marked the full return to in-person instruction. I used lessons learned from teaching online to support students in the return to in-person classes. This included more flexible means of engaging with the course material (e.g., using Perusall and Microsoft Teams for collaborative notetaking and sharing material), self-assessments, and grace periods.

**RESEARCH:** I continue research at the intersections between gender analysis, resources, and global governance. A couple of recent projects on the politics of global climate governance have recently been published. Revisions on my book project on global land governance are being completed and I am working on a new project related to gender and global agricultural value chains. I am also a co-Investigator on the SSHRC Partnership Grant, "Vulnerability to Viability (V2V): Global Partnership for Building Strong Small-Scale Fisheries Communities," which is enabling some interesting cross-fertilization of ideas with my colleagues in ENV.

*Selected new publications:*

- Etinger, Aaron and **Collins, Andrea M.** "Trumpism and the rejection of global climate governance," (*International Relations*, Online February 2023). <https://doi.org/10.1177/00471178231153555>
- Fawad, Anusheh, **Collins, Andrea M.** and Neil Craik. "A Feminist Climate Policy? Examining Canada's Climate Commitments," (*Environmental Politics*, Online November 2022). <https://doi.org/10.1080/09644016.2022.2144011>
- Ackah-Baidoo, Patricia, **Collins, Andrea M.** and Grant, J. Andrew. "Gender and Global Land Governance in Ghana and Uganda," in *Natural-Resource Based Development in Africa: Panacea or Pandora's Box?* University of Toronto Press, edited by J. Andrew Grant, Nathan Andrews and Jesse Ovidia, (2022). Pp. 101-122.

**OUTREACH & SERVICE:** I am an Associate Editor for the *Canadian Journal of Development Studies*. I recently presented at the *International Studies Association* Annual Conference in Montréal and delivered a webinar on gender analysis for the V2V Research Partnership. I also co-authored a piece on gender equity and sustainable fisheries for [The Conversation](#) with recent SERS graduate Dr. Madu Galappaththi and Dr. Derek Armitage.



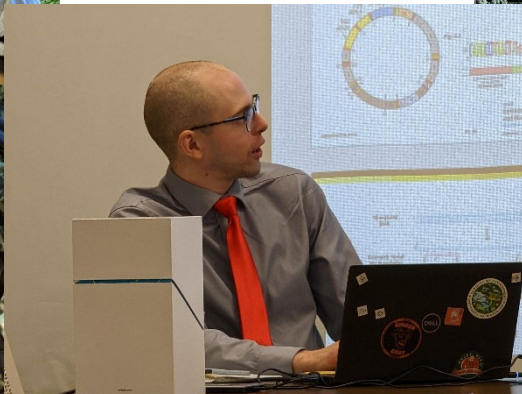
Simon Courtenay lab – selected highlights, in no particular order:

Top row left to right:

- ERS 403 Hon Thesis student **Holly Hussey** who measured the impact of the Canadian Water Network's Canadian Watershed Research Consortium: Did it improve how we do monitoring in support of Cumulative Effects Assessment in Canadian watersheds? Sort of...
- Biol 499 Hon Thesis student **Melanie Lo** who explored use of environmental flows in Canadian environmental legislation & policies (co-supervised by PhD student **Nat Bergbusch**)
- **ERS 374 The Ocean, Human Impacts & Sustainability** – inaugural field course offering with 12 students and co-taught with **Trevor Swerdfager**. Here we are on a salmon aquaculture feed barge in Passamaquoddy Bay, New Brunswick August 10, 2022. Yup, it was a blast!

Bottom row left to right:

- PhD student **Jess Kidd** (back centre) who rebuilt and co-taught with me the Collaborative Water Program's WATER 602 field course. Larry Mellors at Landon's Creek in the Grand River watershed, September 1 2022. Thank you Jess for making my last CWP experience great!
- **Mark Saunders** at his MES defence Dec 6, 2022 showing that environmental DNA is an excellent tool for describing fish communities in PEI estuaries. Mark now works for R.J. Burnside & Associates Limited engineering and environmental consulting firm in Guelph
- Biol 499 Hon Thesis student **Shelby Robertson** showing that the Banff wastewater treatment plant introduces microplastic-like particles into the Bow River, Banff Alta August 2022





## Rob de Loë

I served as Associate Director, Undergraduate for SERS between May 1, 2022 and December 31, 2022. On January 1, 2023, I became Associate Dean, Research, for the Faculty of Environment.

My research during 2022-2023 emphasized my new area: integrating art and science for water engagement. I completed work on a SSHRC HSS grant, and started work on a new SSHRC Insight Development Grant (IDG), which was launched June 1, 2022: *Change is Normal, But Not All Change is Good: Integrating Art and Science for Water Engagement*. This IDG project involves collaboration with several partner organizations in southern Ontario (Conservation Halton; Credit Valley Conservation; and rare ECO Centre). Fieldwork took place at multiple sites, including 16-Mile Creek in Oakville and Silver Creek in Halton.



The last of my water governance funded projects ended during the evaluation period. I have one PhD student remaining from that project. I also worked with graduate students on publishing work from their doctoral research, which had been completed prior to and during the reporting period; and completed a related publication project with a colleague.

For the 2022 TD Walter Bean event, I organized a photography exhibition by Inuit artist Robert Kautuk. This was a good fit with my new research direction.

I joined SERS on August 1<sup>st</sup>, 2022. I found a very welcoming community. The past eight months have been exhilarating and rewarding. I am working to establish my research program on social impact assessment, mining impacts, and equity and inclusion in natural resource governance. I am also trying to recruit students (Oh joy!).

### **Research**

- I published a book chapter, Egunyu, F. 2023. Collaborative forest management in Uganda: Policy, Implementation and Longevity. In Adaptive Collaborative Management for Forests and People: Past, Present and Future, Carol J. Pierce Colfer (Editor). Earthscan Publications Ltd. [Invited book chapter]
- I obtained funding from NRCAN to investigate and recommend indicators for measuring socio-economic impacts of resource extraction in resource-based and Indigenous communities in Canada.
- I continued to collaborate with researchers and practitioners on a SSHRC funded project, Transdisciplinary Education Collaboration for Transformations in Sustainability (TRANSECTS) where I am a co-applicant.
- I worked with faculty from universities in Canada, Ghana, and Uganda to develop and submit a proposal to the SSHRC Insight Development Grant February 2023 call. I worked with other researchers to submit a proposal to the SSHRC Partnership Grant November 2022 call. I was also a collaborator on a proposal submitted to the Spencer Foundation (USA) in December 2022.

### **Teaching**

- I prepared materials and taught an in-person course, ERS316 Urban Water and Waste Management Systems. I brought three in-person guest lecturers from the Region of Waterloo to the course. I also brought in a former student of the course to share their experience of the course and the opportunities it provided.
- I was the instructor for the online course ERS215 Environment and Sustainability Assessment.
- I was the reader for a MES thesis.
- I was a guest lecturer for the ERS100 course.

### **Miscellaneous**

Under the leadership of Ian Rowlands, I am exploring opportunities to collaborate with the African Leadership University.

### Research Impact

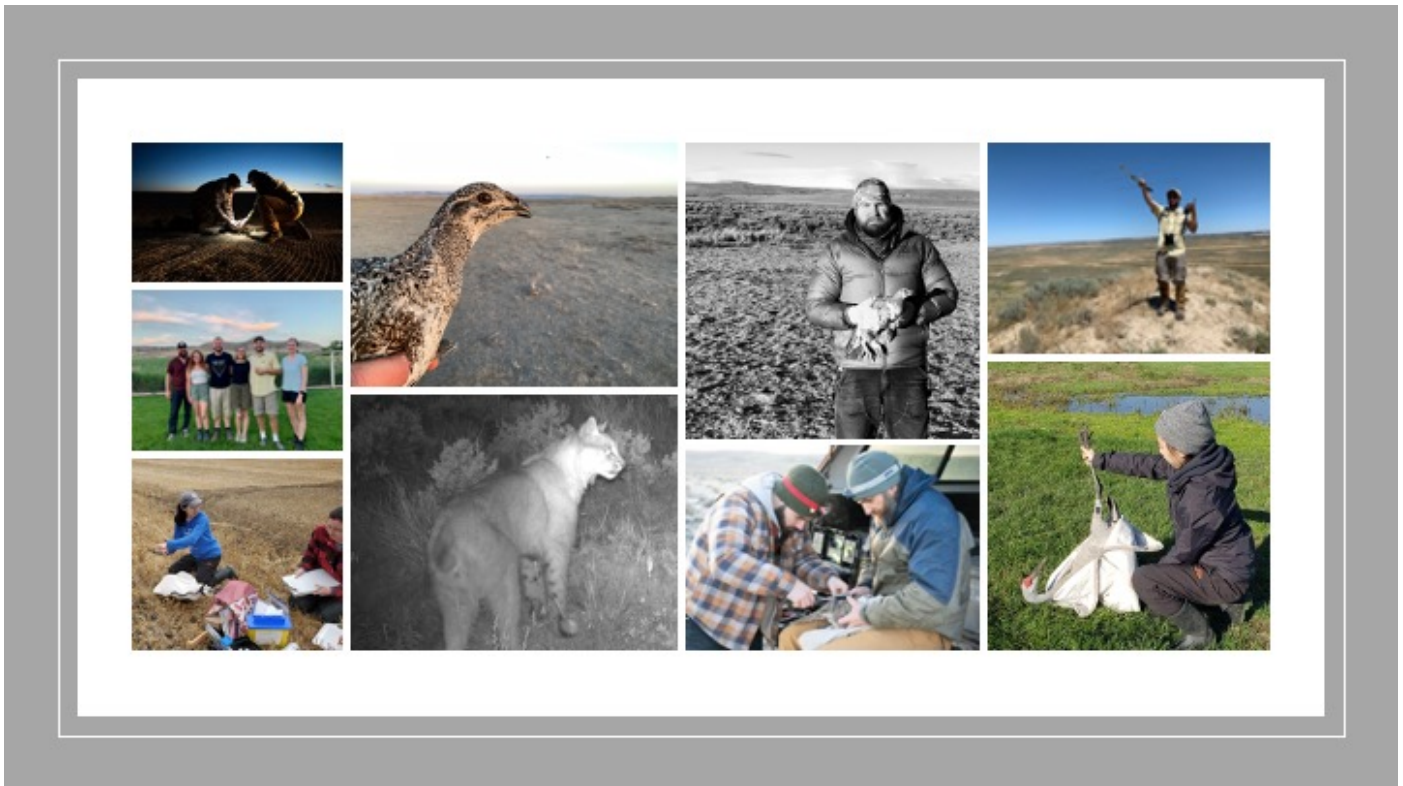
United States Federal land management agencies are re-visiting national sagebrush biome conservation plans. My research on genetic connectivity of sage-grouse across their range in the United States is a fundamental data source guiding connectivity management and policies. Additionally, six states have independently used our data products to help guide within-state management of sage-grouse including the delineation of thousands of new acres of Priority Areas for Conservation. Additionally, in the past year my lab group has published six peer-reviewed articles in high impact journals addressing the ecology and management of sage-grouse across their range, waterfowl throughout the boreal forest, and moose in Ontario. My research has also developed new approaches in the analysis of population genetic data, model-based estimates of wildlife harvest, and machine learning approaches in the study of temporal variation in habitat selection.

### Data Collection

The Fedy lab returned to field work in full force in summer 2022 and we already have three graduate students and four research technicians in the field in April of 2023. Additionally, after UW Plant Operations disposed of 10 years' worth of genetic samples from my -20°C freezer, I have built collaborations with other researchers to rebuild my sample collection. I am beginning new collaborations with other researchers on the genetic analysis of gray jays in Ontario and mountain lions throughout Wyoming.

### Student Recruitment Update

Most of my graduate students graduated during the pandemic. During 2022 I recruited a new PhD student (Jordan Reynolds) who was recently awarded an NSERC Scholarship and 2 new Masters students.



## Highlights

- Appointment as University Research Chair in Water and Development Policy
- Reappointment as member of the Global Water Partnership (GWP), Technical Committee
- Appointment as Senior Advisory to the UN for its 2024 World Water Development Report; delegate to 2023 UN Water Conference for Waterloo, NEWAVE and GWP delegations
- Launch of [Blue Range Labs](#), a research group and impact lab
- Appointment of Dr Graham Epstein as Head of Evidence Synthesis and Dr Fabiola Alvarado-Revilla (Oxford) as Head of the Impact Lab for Blue Range Labs
- Lead edited (Environmental Research Letters) and co-edited (Conservation Science and Practice) special issues on “Markets and the Commons” and “Conservation Philanthropy” Respectively

## Research and Service

- Grants (NEW only):
  - PI: (1) New Frontiers for Research Fund, Post-Pandemic Recovery (\$500,000) on informal water solutions for inclusive development; (2) International Development Research Centre (\$200,000)
  - Co-I: Solutionscapes (ECCC, ~ \$4M, lead Prof Nandita Basu)
- Selected Workshops:
  - TD Walter Bean Workshop on Pathways to Water and Food Security
  - Economics of Water, invited book proposal (Garrick lead editor) with Profs Quentin Grafton and Sarah Wheeler, and Dr Soumya Balasubramany from the World Bank
- Selected Publications:
  - **Garrick, D.**, et al, 2023. "A systems perspective on water markets: barriers, bright spots, and building blocks for the next generation." *Environmental Research Letters* 18.3
  - Beresford, M., Wutich, A., **Garrick, D.** and Drew, G., 2023. Moral economies for water: A framework for analyzing norms of justice, economic behavior, and social enforcement in the contexts of water inequality. *Wiley Interdisciplinary Reviews: Water*, 10(2), p.e1627
  - Matthews, N., Dalton, J., Matthews, J., Barclay, H., Barron, J., **Garrick, D.**, Gordon, L., Huq, S., Iseman, T., McCornick, P. and Meghji, A., 2022. Elevating the role of water resilience in food system dialogues. *Water Security*, 17, p.100126.
  - **Garrick, D.**, Alvarado-Revilla, F., de Loë, R. and Jorgensen, I., 2022. Markets and misfits in adaptive water governance: how agricultural markets shape water conflict and cooperation. *Ecology and Society*, 27(4)
- Social Enterprise:
  - Co-founded [Water Cycles Expeditions](#), a citizen science initiative and social enterprise focused on reconnecting people and water through cycling to generate data and insights about the ways communities value and share water. Covered in [LA Times](#), April 22<sup>nd</sup>, 2023

## Teaching and Mentorship

- SERS
  - ERS 320: Economics and Sustainability. Re-launch of ERS 320 to provide survey course on economic perspectives on sustainability with a focus on water, biodiversity and climate.
  - WATER 601: Integrated Water Management. Contribution to Collaborative Water Program
- Graduate Students
  - Director of Research, NEWAVE Marie Curie Innovative Training Network (15 PhDs), European Commission
  - Comprehensive exam for Isabel Jorgensen; Completion of DPhils (Oxford) for Dr Safa Fanaian and Dr Jesper Svensson. Dr Fanaian is research fellow at Australian National University, supporting the global commission on the economics of water. Dr. Svensson is postdoctoral fellow at Lund University, advancing research on the effect of agricultural subsidies on biodiversity governance
  - Recruitment of Melanie Michaud (MEM) and Elisha Ochieng (PhD) as incoming International DDI



For the past year, indeed for the past quarter century and more, I have mostly been working to encourage and inform serious attention to sustainability imperatives in applied decision making. Much of the focus has been on reform of law-based impact assessment processes to next generation standards, and on lessons from innovative sustainability-based approaches to regional-scale land use and resource planning and management.

It has been a long succession of wonderful learning experiences. This year's most active cases centred mostly on sustainability-based regional/strategic assessment, in the Northwest Territories (anticipating more mining and infrastructure in the Slave Geological Province), Newfoundland & Labrador and Nova Scotia (anticipating offshore wind developments), Ontario (anticipating mining and infrastructure in the Ring of Fire region and implications for the Mattawa and Mushkegowuk First Nations), and in Canadian federal jurisdiction generally (a draft policy framework for regional assessments under the federal *Impact Assessment Act*).

As in the past, the cases have been fascinating. The communities of colleagues involved – graduate students and other academics and advocates – continue to be exceptionally able and amiable. The issues remain richly complex and the response options still include openings for optimism. But the crucial test is the extent to which our efforts have had tangible positive effects in transforming understanding and performance. On that, the news is at best mixed.

Other than the promising NWT initiative, the regional/strategic assessment cases noted above have been characterized by unwillingness to use now available legislated authority to do the kinds of regional assessments of cumulative effects and future options that the academic literature and advanced practitioners have been seeking for decades. Evidently, there's more work to be done.

Happily, another year of successful graduate dissertation or thesis defences has delivered additional energy and expertise to enhance our prospects:

**Kiri Staples, PhD**, graduated in 2022 with a dissertation on approaches to cumulative effects in cooperation with the Tr'ondëk Hwëch'in First Nation and concerning their territories in the Yukon.

**Jordan Bean, MES**, also graduated in 2022, with a thesis on collaborative impact assessments including Indigenous authorities and is now employed by one of the major Canadian consulting firms in the field.

and

**Ignacio Aguilar** is wrapping up final submission of his successfully defended doctoral dissertation on a sustainability, complexity and transformation-based assessment framework for (re)designing electrical energy systems.



## Brendon Larson

Brendon concluded his six-year term as Associate Dean – Undergraduate on June 30/22, completed his spring teaching, then began a one-year sabbatical (Sept. 1/22 – Aug. 31/23).

While his term as ADUG was fulfilling in many respects (and he enjoyed working with such a great team), especially where he felt he made some headway on behalf of our students, he was happy to conclude his administrative service and return to focused scholarly life.

Some highlights of the year:

- His long-running Ontario Natural History field course (ERS 283) had to move to a new location on the Bruce Peninsula in 2022. Although this required extensive course redevelopment, it allowed more students (25) and the new location/design provided great field opportunities for them.
- There had been no major change to the labs in Field Ecology (ENVS 200) for at least a decade, so to begin the process of refreshing the course, he created a new lab on lichens, with our wonderful PhD student Patrick Lauriault's support – and you may thus have seen students peering through hand lenses at lichens on campus trees.
- After a nadir of grant-writing and research time as ADUG, he successfully re-entered the grant-writing game with a SSHRC-IDG, "Do Biodiversity Apps Facilitate Connection to Nature?: A Mixed Methods Study of iNaturalist," in winter 2022, with PhD student Savannah Stuart starting on the project in the fall.
- Faculty of Environment Outstanding Performance Award (2021)
- He published a few papers with his exemplary recently graduated PhD student Rachael Edwards (School of Planning), who worked on EDI-related issues in park visitation in the UK.
- A challenging, enjoyable collaboration with a philosopher and a psychologist was published in *People and Nature* (<http://doi.org/10.1002/pan3.10267>), with associated op-ed in the *Toronto Star* (<https://www.thestar.com/opinion/contributors/2021/06/27/how-to-prepare-children-for-ecological-decline.html>).
- In April 2022, he attended a 2-day transdisciplinary workshop on "Problematic STEM jargon" in San Diego funded by NSF through an ADVANCE Resource and Coordination Emerging Research Workshop.
- He spent the fall in Europe, including time as a visiting professor in the Department of Geography, Friedrich Schiller University Jena, Germany, hosted by a former colleague in ENV, Alexander Brenning.

ERS283 students with plant puzzle	With Jena colleagues at 'football' game	Gratuitous cuteness: son Caspien with spotted salamander
		

Kelsey Leonard

## Research

Throughout this year, I have continued my research in the areas of Water, Ocean, and Climate Justice, and have published several articles and book chapters related to my research.

*New articles and book chapters published this year:*

### ***Ocean Justice:***

- Leonard, Kelsey, Pier Luigi Buttigieg, Maui Hudson, Kenneth Paul, Jay Pearlman, and S. Kim Juniper. "Two-eyed seeing: Embracing the power of Indigenous knowledge for a healthy and sustainable Ocean." *Plos Biology* 20, no. 10 (2022): e3001876.
- Bender, Michelle, Rachel Bustamante, and Kelsey Leonard. "Living in relationship with the Ocean to transform governance in the UN Ocean Decade." *PLoS Biology* 20, no. 10 (2022): e3001828.

### ***Environmental Justice:***

- Ali-Joseph, Alisse, Kelsey Leonard, and Natalie M. Welch. "Indigenous Environmental Justice in US and Canada Sport Stadiums." *Sport Stadiums and Environmental Justice* (2022): 32.

### ***Energy Justice:***

- Sovacool, Benjamin K., Shannon Elizabeth Bell, Cara Daggett, Christine Labuski, Myles Lennon, Lindsay Naylor, Julie Klinger, Kelsey Leonard, and Jeremy Firestone. "Pluralizing energy justice: Incorporating feminist, anti-racist, Indigenous, and postcolonial perspectives." *Energy Research & Social Science* 97 (2023): 102996.

In addition, I am proud to announce the opening of the WAMPUM Lab's main office in EV1 Rm 126. In Fall 2022, we welcomed two new staff members, Lauren McElroy and Jade Hill, as Research Associates, and Jade also serves as the Lab Manager. In February, the WAMPUM Lab celebrated the opening of our co-curated Water Messages exhibit at the MARKK Museum in Hamburg, Germany, featuring our research on Indigenous water governance and conservation.

I also served as the invited keynote for numerous conferences and events this year, including a major panel for the AGU and as an invited speaker for the Chautauqua Institution summer lecture series.

## Teaching

- I continued to offer ERS 200 Indigenous Sustainability Entrepreneurship with collaborations with entrepreneurs such as Cheekbone Beauty, Birch Bark Coffee, Morning Light Kombucha, and more!
- I was able to take on ERS 301 from the masterful Bob Gibson and had a great time working with students to reimagine the course, including explorations of themes of sustainability in children's literature.

## Service

- I am pleased to report my reappointment to the Great Lakes Water Quality Board, and I continue to serve as the co-chair and lead author for the Water Resources Chapter of the New York Climate Impact Assessment, as well as a chapter author for the U.S. Fifth National Climate Assessment Tribes and Indigenous Peoples chapter.

## Miscellaneous

Lastly, I am honoured to have been named a Wavemaker by Nautica and featured in People Magazine's Beautiful Issue for my work on water justice.



## Chantel Markle

I joined SERS/GEM in January 2023 as an Assistant Professor. It has been an exciting and busy few months getting settled into my new role. A few highlights since my arrival:

- I taught ENVS 278: Applied Statistics for Environmental Research in Winter 2023. I hosted a weekly coffee hour as an informal way to chat statistic with the students.
- I am looking forward to teaching ENVS 278 and ENVS 200 next Winter 2024.
- My first undergraduate student, Maggie Chan, joins me as a NSERC USRA summer research student.
- My first two graduate students will join the lab in September 2023.
- Incoming graduate student Victoria Steblaj was successful in receiving an NSERC CGS-M scholarship – congrats!
- I served as an external examiner on a MSc defence at Laurentian University.
- I was featured as the faculty profile for the SERS student newsletter.
- I volunteered at Waterloo's March Break Open House as an opportunity to meet potential new SERS students.
- I accepted the invitation to serve on the Animal Care Committee as an Aquatic/Field expert for a 1-year period.
- Field season is off to a great start and we have many reptile research projects continuing this summer with ongoing and new partners!



Releasing a Blanding's turtle back to the wetland after taking measurements as part of an ongoing population study (all handling conducted under approved permits).



Dan has several inter-related research projects that have kept him busy from May 2022-April 2023:

### **WISIR Research on Social Innovation: Connecting Inner-Transformation and Systems Transformation**

The Waterloo Institute for Social Innovation and Resilience (WISIR) was established here at UW in 2010 under the leadership of Dr. Frances Westley (retired 2019). Since Dr. Westley's retirement, I have taken over as Director and helped WISIR to become a UW Senate-recognized Centre within the Waterloo Institute for Complexity and Innovation (WICI), as part of its 5-year review. In support of this transition, and building off the body of research and teaching since WISIR's establishment, I have begun to broaden our research focus from a focus on systems-transformation to linking inner-transformation with broader systems change and innovation. In WISIR's most recent pedagogical intervention with colleagues from the Banff Centre, 2016-2019, we were able to incorporate aspects of Jungian depth psychology as part of our curriculum in systems change with great effect. Over the COVID-19 pandemic, much of my community-based research had to be, understandably, paused. During this time, I began to read extensively, and take online courses in, the field of Jungian depth psychology and psychoanalysis. I have also been engaged in my own psychoanalytic practice with a licensed therapist for the last five years. Work such as the UN's Inner Development Goals, as complementary to its Sustainable Development Goals, has provided useful context for this work. We are in the process of developing new conceptual frameworks that link inner development, depth psychology and systems change as part of a reformulation of our definition of social innovation. This work has led to a partnership with the Musagetes Foundation in Guelph and a MITACS post-doctoral fellowship for Kira Cooper (SERS PhD Candidate) to further explore the role of depth psychology and psychoanalysis in systems change and design organizational interventions to support continuous innovation.

### **Co-reclamation in the Oil Sands**

While the original, collaborative project between Fort McKay First Nation (FMFN), Suncor, University of Calgary and University of Waterloo has ended, this work continues through several manuscripts, reports and funding proposals in an ongoing collaboration with FMFN. The intent of the original project was to transform, and begin the process of healing, the relationship between the Fort McKay First Nation (FMFN) and the Suncor Energy Company around reclamation while attempting to heal the land. Most recently, former UofC PhD candidate, Christine Daly has been awarded a SSHRC post-doctoral fellowship to continue this work with Fort McKay here at University of Waterloo.

### **Reconciliation, Education and Research on Haida Gwaii**

This SSHRC Insight Grant-funded project in collaboration with the Haida Gwaii Institute and the Haida Gwaii Museum and the Universities of Waterloo, British Columbia, Lethbridge and Alberta has continued despite the COVID-19 interruption to community-based collaboration. This research aims to explore, support, and inform a precedent setting intercultural social innovation through an Indigenous research collaboration in one of Canada's most renowned reconciliation contexts - Haida Gwaii. For the purposes of this research, we consider intercultural social innovations to be grounded in a shared responsibility to reciprocally and respectfully navigate the evolving landscape of reconciliation in Canada. In the context of the COVID-19 pandemic, we hired two research associates from the Skidegate and Old Massett communities on Haida Gwaii to support continued research on behalf of the HGI and the Haida Gwaii Museum. Our research has contributed to the pre-feasibility of a Haida-led research institute and Haida-led research protocols, supported by our research team and the grant. Our research has also contributed to the development of a new HGI/UBC Micro-certificate in Co-Management. This project is scheduled to wrap-up in early 2024.



Conservation and Restoration Ecology Research Group

### **FY 2022 Activities in the Conservation and Restoration Ecology (CaRE) Research Group in SERS**

Steered by **Prof. Stephen Murphy** in SERS (that's the person writing this deathless piece of literature), we had a good year despite the ongoing pandemic (and no, it is not over).

The group consists of stellar students, many of whom have already started on their dream careers as they finish their theses; my job is to facilitate that and their scholarly progress, so I think we're collectively succeeding on that front. And that's good because we have a lot to live up to with so many other success stories in SERS with other groups and with excellent colleagues in our other units in FENV.

MES student Kealan Branellec overcome multiple barriers to his original concept (which was to be based in Peru – the country at the top of suffering with COVID) and completed a wonderful thesis using remote interviewing to assess and design a multidisciplinary approach to mid-level education. MES student Juan Sebastian Sanchez Castillo also worked around some larger COVID barriers and – with the big help of Prof. Brad Fedy (thank you Brad!) – devised a terrific thesis that looks at how we can better assess how birds make choices of their habitat using different cues at different scales – does a bird care more about what they see in their bird's eye of a whole vast landscape across the horizon, or do they care more about the fine details of what they see in a local patch of grass? MES student Jason Phoenix finished his thesis on designing and implementing a restoration approach to a degraded site in the iconic Algonquin Provincial Park. Jason is staying with us as a PhD student focusing on best practices for agroecosystem restoration – he won a big NSERC award too! MES student Rohit Verma – like all others stymied by COVID restrictions – completed an innovative project using advanced drone technology to assess parasite damage to trees, especially in peri-urban areas. Our other dozen group members have had some big personal news and triumphs (several marriages and children born!) as well as professional advancement and – for the earlier career colleagues – excellent launches of careers. We benefit from the excellence of the group members like Tim Alamenciak, Dorian Pomezanski, and Stephanie Cruz Maysonet who were part of a big SSHRC funded initiative on restoration ecology strategies in Canada, with the first publication forthcoming. Our recent alumni – PhD students Michael McTavish, Heather Cray, Jonas Hamberg and post-doc (and ug graduand) Justin Gaudon – led a paper on urban noise attenuation as well as numerous other specialized publications from their theses or post doc work. Dan Kraus – current PhD student but also Director of National Conservation for the Wildlife Conservation Society Canada – has been publishing his thesis chapters already, building off his first one (with me and Derek Armitage) Ten Bridges on the Road to Recovering Canada's Endangered Species. Facets. <https://doi.org/10.1139/facets-2020-0084>.

My own focused work continues to be on (1) strategic initiatives in ecological restoration for Canada, North America, the EU and the world, (2) effective and efficient replication of technical approaches to ecological restoration, (3) conservation in parks and protected areas, especially with the Centre for Applied Sciences in Ontario Protected Areas (CASIOPA) that I chair, and (4) translational ecology and technology transfer in efforts to create open-access databases for scholars and practitioners in ecological restoration. My work has shifted to being more EU-centric with some major research grants and that means I've begun successional planning and hand-over to early career colleagues with some of the more local long-term (25-30 year) conservation and restoration projects in Ontario.

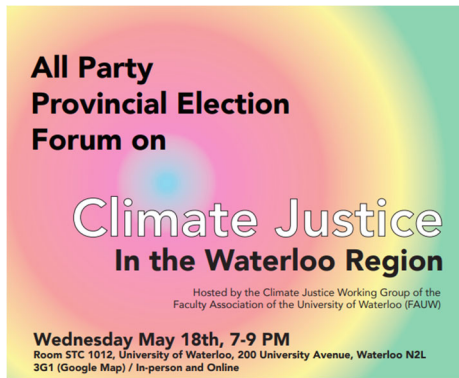
Following is a photo that highlights my first overseas trip since 2019, a workshop with colleagues in Germany (this is about an hour outside Munich):





I have enjoyed being back on campus interacting with students and colleagues.

One highlight last spring was organizing and hosting an all-party Ontario election forum focused on climate justice. It was one of the only formal debates on the environment during the Ontario election.



For my War and the Environment (ERS 222) course last spring, we partnered with Wikipedia’s education program (Wiki Edu). Developing and reviewing Wikipedia articles has been a great way to train our students research and critical thinking skills while supporting a healthy trend towards open scholarship.

After my non-teaching term in the fall, I spent the winter semester teaching two large classes: ENVS 131 and ENVS 205. I trained and worked with a great team of six Teaching Assistants. Drawing on my experience as a judge for the Ontario (Highschool) Ethics Bowl, we facilitated tutorial ‘debates’ on topics in environmental ethics for ENVS131. Like traditional debates the Ethics Bowl format has two teams and it’s important for teams address counterarguments. The difference with the Ethics Bowl format is that both teams can adopt the same position since the contest is to deepen critical understanding of the moral dimension rather than ‘win’ through rhetorical maneuvers. The discussions end up being more collaborative but intellectual risk-taking is still encouraged and rewarded.



Teaching with Wikipedia

A flyer for a "Climate Justice Advocacy 101 Workshop". It features a central illustration of a globe with people holding signs that say "Climate Justice", "Fossil Free", and "Green New Deal". To the left is a cartoon character with a thought bubble asking "How can I get more involved?". The text includes: "WORLDWIDE CLIMATE JUSTICE TEACH-IN", "Wed. March 29th 10-12pm EV1-353", "Climate Justice Advocacy 101 Workshop", and a list of bullet points: "Learn social movement strategies and tactics for realizing climate justice (e.g., political lobbying, civil disobedience, activist art, elections, etc.)", "Hear about successful environmental advocacy campaigns (e.g., Fossil Free UW)", and "Get connected to environmental and climate justice organizations". It also states "No previous advocacy/activism experience needed!" and includes logos for the University of Waterloo and Fossil Free UW.

This spring I enjoyed teaming up with Fossil Free UW to run a workshop as part of ENVigorate and the Worldwide Teach-in on Climate and Justice. The workshop helped introduce participants to social movement theory and climate advocacy/activism.

I have been coordinating a panel for the 2023 Teaching and Learning Conference comprised of instructors from the faculties of Health and Environment. We have been meeting to discuss “Pedagogies of Care in Uncomfortable Spaces,” looking at the role of care and compassion in deepening critical thinking and reflexive practice, e.g., during classroom discussions on contentious topics as well as community-service learning activities.

### Associate Directorships

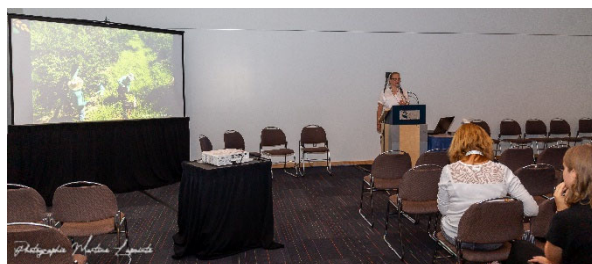
- Waterloo Centre for Microbial Research (Associate Director)

### Editorial activities and Conferences

- Associate Editor: Agroforestry Systems
- Associate Editor: Journal of Environmental Quality
- Editorial Board: Environmental Management
- Guest associate Editor Geoderma Regional: *Transitioning to healthy soils with agroforestry*

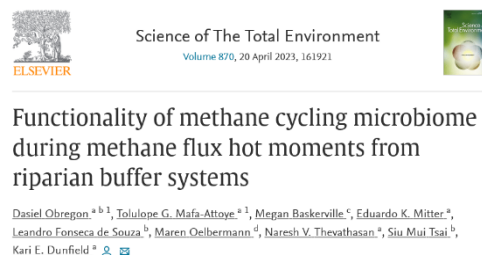


- Lead session organizer (with J. Whalen McGill and S. Chang U Alberta) and convener on *Transitioning to Healthy Soils* at the 5<sup>th</sup> World Congress of Agroforestry, July 2022.



### Publications

- Multiple peer-reviewed publications on our work on biobased residues and riparian zones were released during this year including papers in Science of the Total Environment, Frontiers, and the Canadian Journal of Soil Science.



### Knowledge Mobilization and Grants

- 8 conference presentations (in person and virtual)
- Collaboration with colleagues across global circumpolar regions in the development of a network for northern agriculture. We have applied for multiple grants. An NSERC Alliance grant (\$882,854) was funded in March 2023) for work in Newfoundland and Labrador.
- Collaboration with a colleague in Chemical Engineering at UW on a grant application with funds requested from Agriculture and AgriFood Canada.
- Collaboration with colleagues from Applied Mathematics, and Electrical and Computer Engineering at UWaterloo in association with international colleagues in Costa Rica for grant proposal development.



## Field Research

- Field research for two projects was completed during this year
  - Perennial bioenergy crops: Carbon and nitrogen dynamics on low productive agricultural land (Guelph Bioenergy Research Station)
  - Mycorrhizae: On-farm bioaugmentation of indigenous mycorrhizal inoculum for more sustainable and profitable production systems (field work in Sault Ste. Marie and New Liskeard)



- Field research for new projects is starting:
  - Tropical Agroecosystems: Biodiversity in tropical agroforestry systems
  - BioSoil North: Soil health, nutrient acquisition, and greenhouse gas emissions in newly converted agricultural land in Goose Bay, Labrador
  - Alpaca Manure: using alpaca waste materials and their conversion to commercial fertilizers

## Students

- Students that completed their degrees: Emmanuel Badewa (PhD), Harkirat Hundal (MES), Adam Kramer (MES), Trisa Johnson (BES), Amanda Disher (BES)
- New Students: Alexandra MacIsaac (MES)
- Visiting Students: Diana Gonzalez (B.Sc.) MITACS Globalink Intern from Mexico

## Publications

- Quilley, S. 'A Complete Act: Conservatism, Distributism and the Pattern Language for Sustainability' *Challenges in Sustainability*, submitted, in press for 2023.

## Writing

- 'Circular Economy or Circular Society? Conservatism, Localism and Ecological Economy submitted to *Environmental Values*,
- 'Ecology 'After Virtue' and after-modernity: Moral Rupture and The Great Transformation' submitted to *Ecological Civilization*.
- Invited to write a paper and attend a conference on E.F. Schumacher at Oxford in June 2023. Title: 'Schumacher against Globalism and Transhumanism: Catholicism, Social Justice and the Politics of Scale' This will be published in *European Journal of Social Theory*.

## Research

Over the last decade, all of my empirical research projects – hedgelaying and landscape innovation; wine production and place-making; a pattern language for traditional music and dance – converge on an approach to political economy rooted in the work of **Karl Polanyi**, the ecological economics of **Herman Daly** and **H. T. Odum's** energy accounting approach to social complexity.

Over the last two years, I have begun to use this work as the foundation for a more comprehensive ecological critique of liberal consumer societies, and the elaboration of a post-liberal political economy. Such a post-liberalism centres on the imperative of subsidiarity – elaborated most coherently, though not uniquely, in Catholic understanding of social justice associated with **Luigi Taparelli**, Leo XIII's (1991) *Rerum Novarum* and the subsequent theorisation of 'distributism' associated with **Hilaire Belloc** and **G K Chesterton**. As such it resonates with the 'small is beautiful' version of green political economy most closely associated with **E.F. Schumacher**. It also stands in resolute opposition to the globalism and eco-modernist vision promulgated by the World Economic Forum as well as the ultra-liberal priority accorded to individual social and spatial mobility associated with most versions of global governance. Starting with a Polanyian distinction between the domains of State, Market and Livelihood, the political economy of post-liberalism emerges from a distinctively Aristotelian anthropology of human nature and an essentially Thomist understanding of natural law. Centring on covenant rather than contract, from the perspective of this relational understanding of green economy, the liberal society of individuals was stable – as argued by both Federalists and Anti-Federalists in drafting the American constitution – only in the context of a pre-existing and common sensical, deeply rooted shared understanding of Judeo-Christian virtue. Providing an overarching moral compass, this lode stone of fossilised virtue has been depleted. And as **Alasdair Macintyre** has shown, with increasingly aggressive secularization, the failure of moral philosophy to find a convincing successor ontology to Aristotelian/Thomist virtue ethics has led to a state of intellectual confusion ('emotivism') which is now spilling over into the political sphere. From this starting point, I have started to explore the Christianity of Schumacher and Daly as an intrinsic rather than accidental component of any covenantal ecological economy. To this end, I am doing a crash course in (historical and systematic) theology as well as post-liberal political philosophy (Macintyre, Millbank). My aim is to develop a postliberal and explicitly Christian understanding of ecological economics, as well as a corresponding critique of globalism and transhumanism (the convergence of genetics, eugenics, technological mediations of pregnancy and sexuality and A.I.) in favour of subsidiarity and localism. Limits to growth, it will be argued, are definitive not merely of our economic prospects, but of the human condition. Rejecting natural limits – whether in relation to flight (Icarus) or creation (Frankenstein's motherless monster) – invariably spells disaster, or as **C.S. Lewis** predicted '*The Abolition of Man*'. Finally, the Aristotelian/Thomist anthropology that underpins this approach to ecological economy is also shared by the most important figures in the conservative intellectual tradition – **Edmund Burke**, **Friedrich Von Hayek**, **Eric Voegelin** amongst others –but has been lost and/or vulgarized by a very American



approach to market liberalism that has downplayed the central importance of covenantal household as a unit of analysis. This will be the outline of the book project that I am currently negotiating with Forum Press.

### Current External Service

This year I became an External Member of the Academic Senate for Our Lady Seat of Wisdom College, Ontario (2022-2025)

### Scholarly

I joined the editorial committee of *Ecological Civilization* - June 2022

### Conferences in 2022

- 'Towards a pattern language for the maintenance and revival of traditional piping' INTERNATIONAL BAGPIPE CONFERENCE 11<sup>th</sup> -13<sup>th</sup> March 2022 – with Anna Beresford
- "Towards a pattern language of traditional music and dance: Local economic development and social capital formation' Arts, Enterprise and Place in the Rural Creative Economy conference (12th, 13th January 2022) online. <https://simonmckerrell.com/creative-rural-conference/>

### Research

- March 31<sup>st</sup> -April 3<sup>rd</sup>, 2022: Research trip to Halifax to conduct first round of interviews for SSHRC project 'Winemaking or placemaking? The role of the craft wine industry in rural Revitalization' with Claudia de Fuentes, St Mary's University

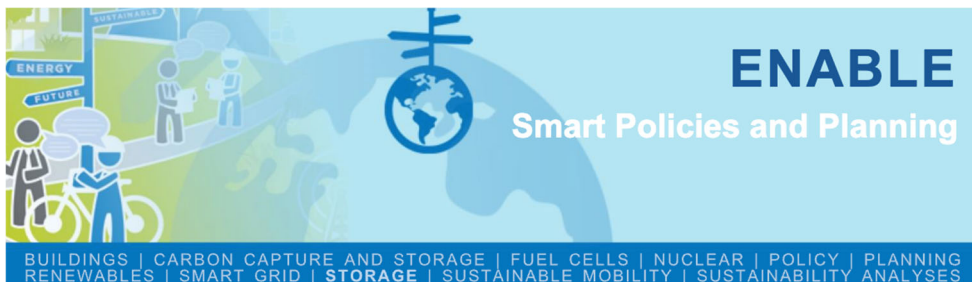
### Personal

On a personal note, my family and I became Canadian citizens – or at least my wife Nikki and I did. The kids had to wait because I filled out the forms incorrectly. The girls crept over the line in November and the boys are still waiting to undergo a rite of passage later this year.

## Ian Rowlands

During 2022-2023, most of my time was spent upon my work as the University's Associate Vice-President, International (AVPI). Nevertheless, I still engaged in a little bit of SERS-related and ENV-related work that was largely outside of my AVPI activities.

- Guest lecture: ERS 201, Environmental Policy, Politics and Governance, on energy and climate change (Prof. Andrea Collins).
- Conference presentation: C. Walker, I. Rowlands, P. Devine-Wright, and I. Soutar, 'The "four Ds", justice, and support in smart and local energy transitions: Analysis from cross-national online surveys in the UK and Canada' (Toronto Conference on Earth System Governance. Toronto, ON, October 2022).
- Invited to participate in sessions associated with the Commonwealth Heads of Government meeting in Kigali, Rwanda, particularly a side-event focused upon sustainable urbanization, 21 June 2022, <https://commonwealthsustainablecities.org/events/chogm2022/chogmday1/>.
- Research Spotlight: Yixin Chen and Ian H. Rowlands, 'Insight into China's energy storage', Waterloo Institute for Sustainable Energy (WISE), 15 February 2023, [https://wise.uwaterloo.ca/news1/research-stories/insights\\_into\\_chinas\\_energy\\_storage](https://wise.uwaterloo.ca/news1/research-stories/insights_into_chinas_energy_storage).



## Helena Shilomboleni

I am delighted to have joined SERS in September of 2022 and has had an extremely positive experience so far working with such supportive colleagues and mentors and great students!

Here are a few highlights from the past year:

### Research:

- I authored several peer-reviewed journal articles in [Elementa: Science of the Anthropocene](#), [Climate and Development](#), and [Agronomy](#).
- I am also authored a book chapter titled: Enabling Markets and Public-Sector Actions for Catalyzing Transformation for Small-Scale Agricultural Producers Under Climate Change, in [Transforming Food Systems Under Climate Change](#).
- Additional publications include an Information brief and a policy brief.
- I applied for a couple of research funding opportunities and have received one so far: a University of Waterloo—SSHRC Explore Grant in the sum of \$ 7,000.

### Teaching:

I have taught two classes so far:

GEOG 207 (Online course with 250 students) and ERS 403 B (in-person course with 14 students).

Both experiences contributed to my learning and growth as a new faculty member, including managing large and small courses and keeping students engaged. I have also participated in Professional Development workshops with the Centre for Teaching Excellence, and plan to attend UW's Teaching and Learning Conference in early May.

### Service:

I thoroughly enjoy serving on a few committees and engaging in volunteer opportunities.

I currently SERS department representative to the Faculty Association of the University of Waterloo.

I also served on this year's [CEE Employer Impact Awards](#) selection committee.

Earlier this year, I started to engage with UW's International Office to support them to build partnerships with African-based institutional partners.

Volunteer opportunities include serving as SERS's Faculty representative at the Ontario University Fair in October as well as participating in the clean-up of UW's campus for Earth Day. See pictures below.

External to the University, I serve as a board member to the Canadian Association of Food Studies (CAFS).



The Trant Ecological Legacies Lab had a great year, with a new logo to show for it (commissioned by a former SERS graduate, now PhD student at McGill, Ali Langwieder):



It has been an outstanding year for research and outreach. Noteworthy highlights include:

1. Successful field campaigns to the Central Coast of British Columbia (**Photo 1ABC**), rare Charitable Research Reserve (**Photo 2**), southern Labrador (**Photo 3**), and northern Nunatsiavut, Labrador (**Photo 4**).
2. ArcticNet Annual Science Meeting in Toronto with graduate and undergraduate students (**Photo 5**).
3. Publication led by PhD student Sara Wickham on “Incorporating place-based values into ecological restoration” in *Ecology and Society*.
4. Annual lab retreat (**Photo 6**)

Alexandra Johnson defended her MES on changing caribou forage and is now working in Alberta for Indigenous Canada. Former Postdoctoral Fellow, Dr. Emma Davis, finished with us this year and is now the Ecosystem Scientist for the Government of Newfoundland and Labrador. These are both amazing new positions, but we sure do miss them around the lab.

#### **Publications for 2022-23**

Ho-Tassone E, Courtenay S, Trant AJ, Miller R. Knowledge co-creation through Indigenous arts: Diversity in freshwater quality monitoring and management. *Journal of Great Lakes Research*. Accepted.

Ho-Tassone E, Judge A, Trant AJ, Courtenay S. Collaborative watershed analysis: A ‘groupthink’ assessment of cumulative effects. *Journal of Great Lakes Research*. doi.org/10.1016/j.jglr.2022.11.004

Wickham S, Augustine S, Forney A, Mathews D, Shackelford N, Walkus J, Trant AJ. Incorporating place-based values into ecological restoration. *Ecology and Society*. Accepted.

Hoffman KM, Cardinal Christianson A, Davis E, Wickham S, Trant AJ. How does cultural burning increase global biodiversity? *Frontiers for Young Minds*. doi.org/10.3389/frym.2022.734864.

Schang K, Cox K, Trant AJ. Habitation sites influence tree community assemblages in the Great Bear Rainforest, British Columbia, Canada. *Frontiers in Ecology and Evolution*. doi.org/10.3389/fevo.2021.791047

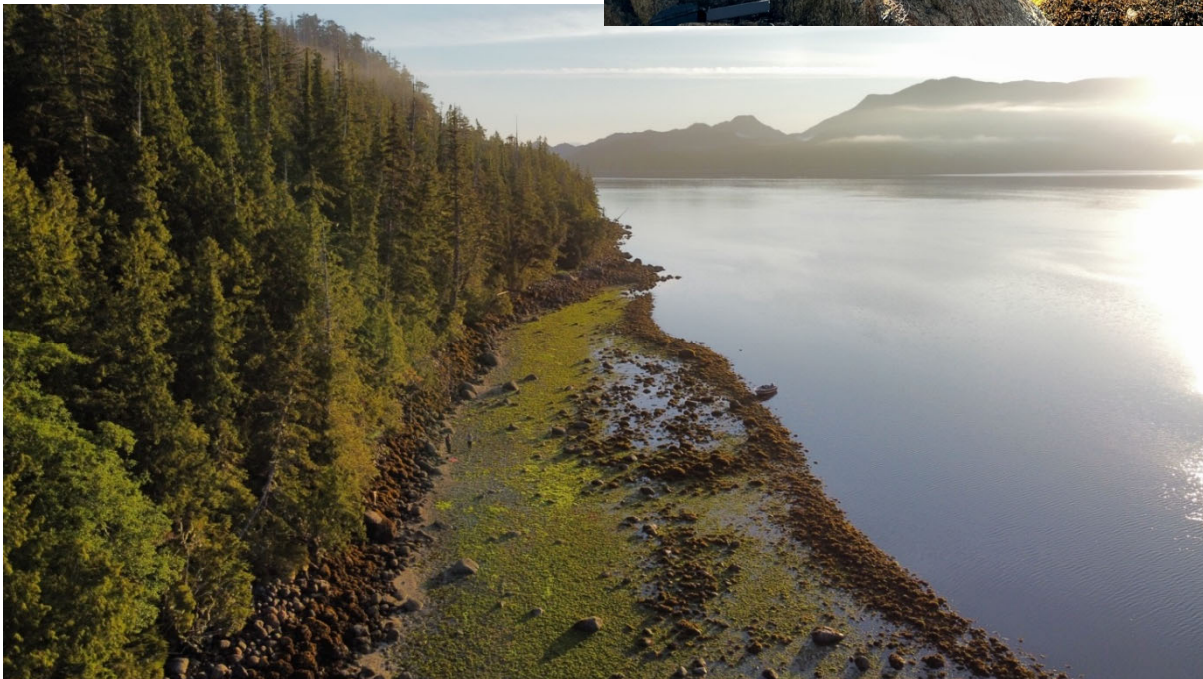
Dias AC, Armitage D, Trant AJ. Uncovering wellbeing-ecosystem services bundles (WEBs) under conditions of social-ecological change in Brazil. *Ecology and Society*. 27(1):44. doi.org/10.5751/ES-13070-270144

Tutton R, Way R, Beddoe R, Zhang Y, Trant AJ. Soil temperature sensitivity to variable snow and vegetation conditions in low-relief coastal mountains, Nunatsiavut and NunatuKavut, Labrador. RCOP2021.





**Photo 1:** Wuikinuxv and Heiltsuk Territories, Coastal British Columbia. Work led by PhD student, Sara Wickham. Photos of A) Andrew Trant and a fog bow, B) Sara Wickham installing cameras on clam garden site, and C) drone image of clam garden.

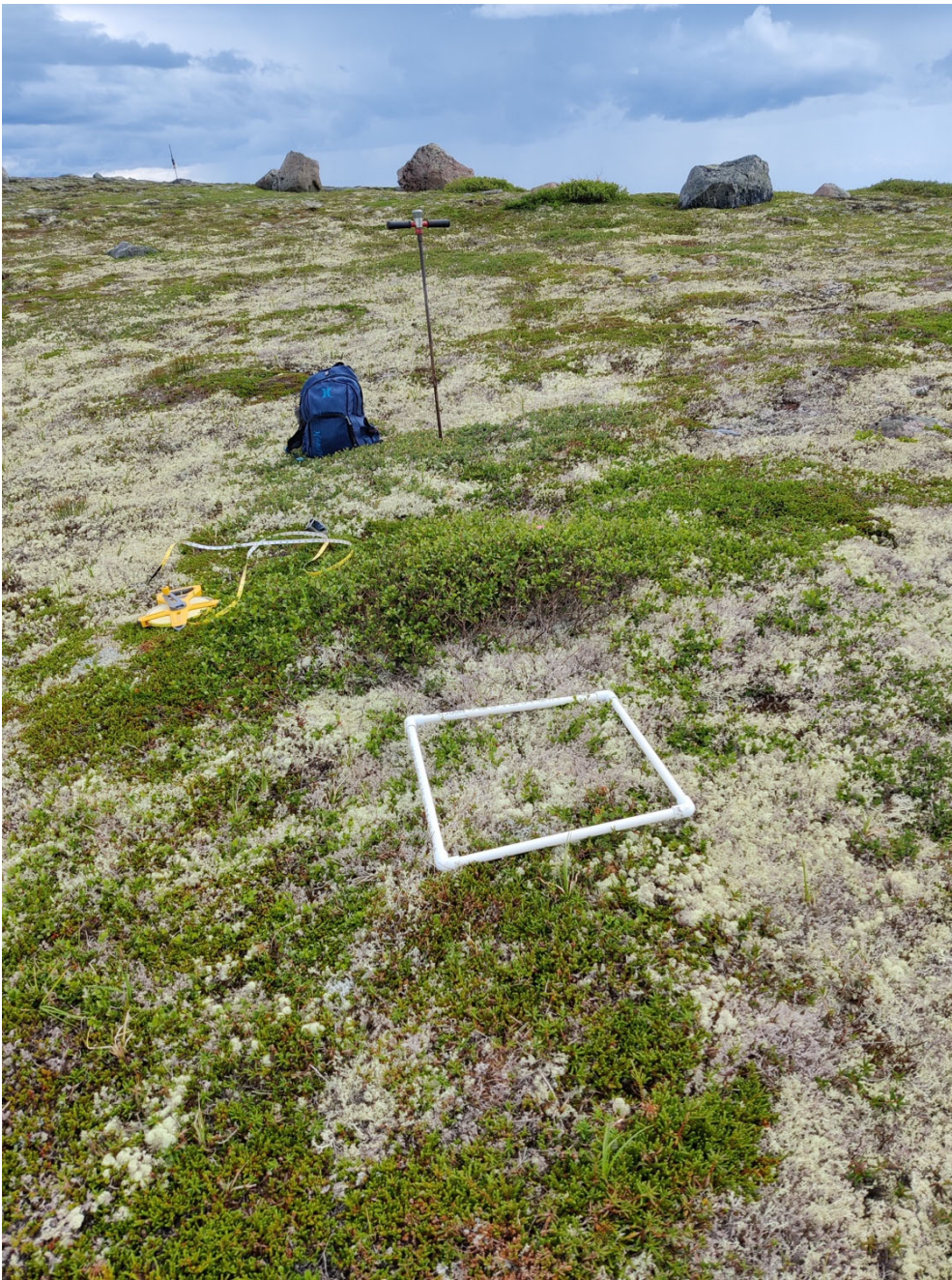






**Photo 2:** Open-topped chambers at rare Charitable Research Reserve in Cambridge, Ontario. Work led by PhD student Kyle Schang.



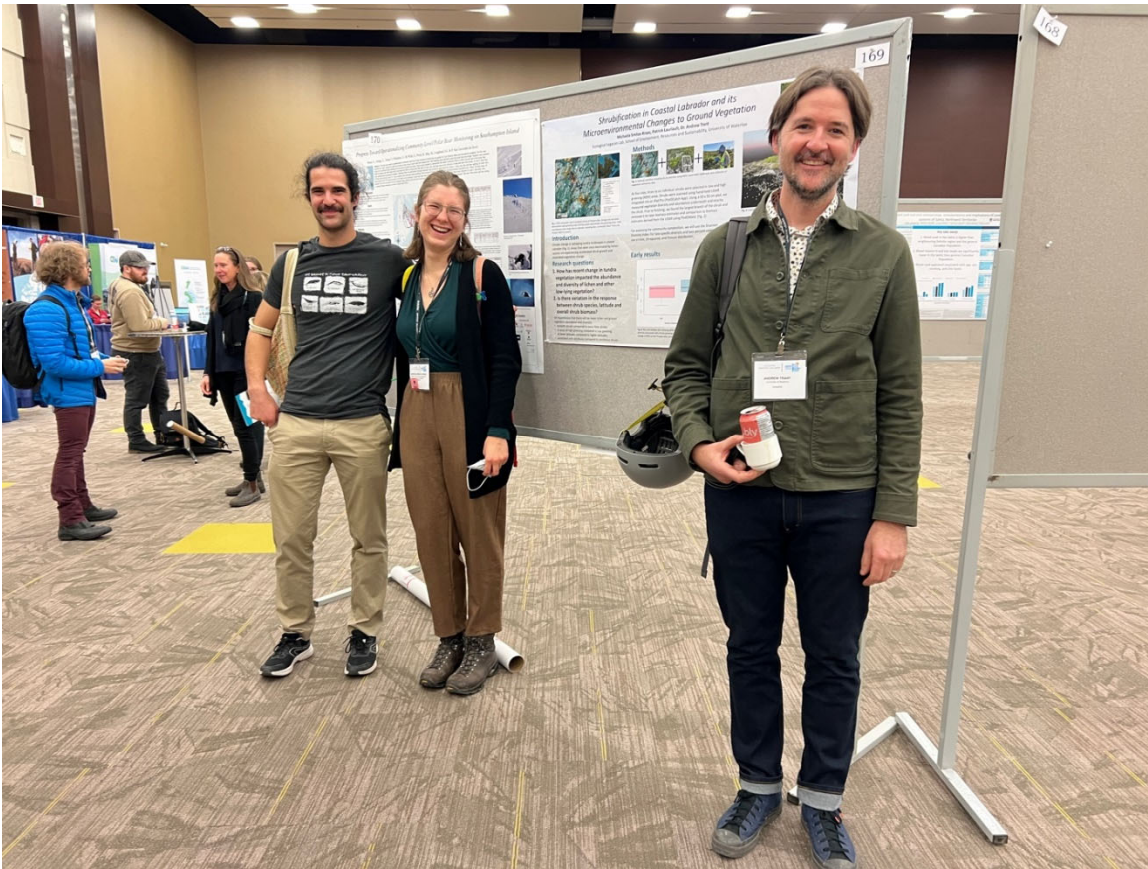


**Photo 3:** Southern Labrador field site (NunatuKavut). Work led by PhD student Patrick Lauriault with support from NSERC USRA undergraduate student Michaela Smitas-Kraas.



**Photo 4:** Northern Nunatsiavut, Labrador (Torngat Mountains National Park). Work led by Andrew Trant (in partnership with Parks Canada)





**Photo 5:** ArcticNet Annual Science Meeting in Toronto with Patrick Lauriault, Michaela Smitas-Kraas and Andrew Trant.



**Photo 6:** Annual Ecological Legacies Lab retreat. It was a joyous but wet weekend.



## SERS Staff

The composition of the SERS staff team changed this year. Jennifer Nicholson left the role of administrative manager in May 2022. The role remained empty until the end of August when Mary Anne Hardy arrived. During the three-month break, Jennifer Nicholson helped for a short time and then Tara Thompson supported SERS finances and human resources for the interim period. Patti Bester monitored the SERS admin email and conducted the monthly safety reviews.

We welcomed Amanda Campbell back from her parental leave in June. Three different people had temporarily filled her role of graduate program administrator / scholarship coordinator while Amanda was on leave.

Patti Bester continued to be the glue that held the School together helping to keep the boat afloat and providing historical context to the new staff and faculty.

The 2022-23 year started with the migration of the SERS website from WCMS 2 to WCMS 3. The layout of the site changed considerably, and staff became trained in the new site management tool.

The Spring term saw the return to more in person classes but the School's halls were still quiet. The Fall term brought more students and faculty back and a bit more life returned. Students still tend to contact staff via email and Teams with fewer in person appointments than prior to the pandemic.

SERS continued its participation in the Green Office program achieving a Gold certification in 2022. We are renewing our participation as people have returned. Mary Anne Hardy attended the Fall Eco-Summit, where two of the three student panelists were SERS students. SERS participated in the Campus clean-up in April 2023 to mark Earth Day.



SERS started a new tradition in the fall of 2022, joining numerous departments across the University in supporting the University Christmas Project. SERS faculty and staff donated their time and money to purchase and wrap Christmas gifts for five children as we supported four families in need on our community.



The SERS staff participated in the SERS graduate orientation hike in September and cycling along the Grand in October.



The SERS community got together in December in the Environment Courtyard to have a holiday lunch for faculty and staff. It was a wonderful opportunity to get together outside of meetings to share a meal and fellowship after a three-year break.

