

Danielle Nowosad



Intro

I am a Red River Métis-settler interdisciplinary researcher that is interested in community-driven freshwater ecology projects. I prioritize working with Indigenous collaborators in participatory research and combining multiple ways of knowing and honours data sovereignty. I am currently investigating the baseline of biodiversity and response to impacts of climate change in freshwater invertebrate/biting insect communities in the Kitikmeot region of Nunavut, using DNA methodologies and IQ (Inuit Qaujimagatuqangit). I have worked with government agencies, academics, non-profits, and the public.

Education

2019 - present

University of Guelph
PhD Integrative Biology

Thesis: Using DNA barcoding as a tool to assess biodiversity of freshwater invertebrates and risks associated with black flies in the Canadian Arctic

Advisors: Dr Sarah Adamowicz, Dr Karl Cottenie, and Dr Ian Hogg

2013 - 2019

University of Winnipeg
BSc with Honours in Physical Geography

Thesis: Effects of seasonality and sediment properties on nutrient cycling in Sub-Arctic tundra ponds

Advisors: Dr Nora Casson and Dr LeeAnn Fishback

Major Awards

2024-2026 \$281,000	2024-2026 \$130,000	Weston Family Foundation Post-Doctoral Fellowship (declined)
	2024 \$10,000	Natural Sciences and Engineering Research Council of Canada (NSERC), Department of Fisheries and Oceans Supplemental Award <i>Government of Canada</i>
	2023 \$10,000	Natural Sciences and Engineering Research Council of Canada (NSERC), Department of Fisheries and Oceans Supplemental Award <i>Government of Canada</i>
	2021-2024 \$63,000	NSERC Post-Graduate Scholarship – Doctoral <i>Government of Canada</i>

	2021 - 2024 \$45,000	Indigenous Graduate Scholarship – Merit <i>University of Guelph</i>
	2021 \$8,000	Graduate Tuition Scholarship (forfeited) <i>University of Guelph</i>
	2020 - 2021 \$15,000	Weston Family Award for Northern Research <i>Weston Family Foundation</i>
Other Awards	2024 \$3,600	Northern Scientific Training Program <i>Polar Knowledge Canada</i>
Total \$35,307	2023 \$3,000	Indigenous Graduate Scholarship – Fulfilling Community Commitments <i>University of Guelph</i>
	2023 \$3,157	Northern Scientific Training Program <i>Polar Knowledge Canada</i>
	2023 \$2,950	NSERC Indigenous Student Ambassador <i>Government of Canada</i>
	2022 \$4,000	NSERC Indigenous Student Ambassador <i>Government of Canada</i>
	2022 \$3,000	James Bourque Northern Scholarship <i>Royal Canadian Geographical Society</i>
	2021 \$7,500	Building Brighter Futures <i>Indspire</i>
	2021 \$1,000	Jim Bourque Scholarship for Northern Research <i>Arctic Institute for North America</i>
	2020	Kishaadigeh “She Who Guards The Lodge” Indigenous Leadership Award <i>University of Guelph</i>
	2020 \$600	First Place – ArcticNet Annual Scientific Meeting Graduate Poster Competition
	2019-2020	Campus Sustainability Recognition Award <i>University of Winnipeg</i>
	2018 \$4,500	NSERC Undergraduate Student Research Award <i>Government of Canada</i>
	2017 \$2,000	Northern Scientific Training Program <i>Polar Knowledge Canada</i>

Research Experience

- 2019 - **Dissertation** University of Guelph, Guelph, Ontario
- 2024 present Advisors: Dr Sarah Adamowicz, Dr Karl Cottenie, Dr Ian Hogg
- Contributing specimens and DNA barcodes to the major Arctic BIOSCAN project as the freshwater invertebrate specialist
 - Working in tandem with Polar Knowledge Canada (federal government) and the Centre for Biodiversity Genomics (University of Guelph)
 - Collecting 267 unique samples from 140+ sites, identifying and plating ~11,000 invertebrate specimens for DNA barcoding, learning the Barcode of Life Data System (online genomic repository), and biodiversity assessment analyses using DNA barcodes as a proxy for species
- 2024 **First Nations Information Governance Centre**
Contract Researcher
- Project entitled "Respecting and Asserting First Nations Data Sovereignty in Research Data Management"
 - Co-writing final report and manuscript
- 2024 - **Environment and Climate Change Canada**
2025 **Contract researcher** Canadian Wildlife Services
- Conducting study on Indigenous perspectives with regards to migratory birds and their monitoring methods
 - Preparing a project management plan, research methods, ethics, materials, finding participants, interviewing participants nationally
 - Analyzing interviews and writing a final report
 - Results will help inform migratory bird policy at the federal level
- 2023 - **University of Guelph, Guelph, Ontario**
2024 **Graduate Research Assistantship** Research Services Office
- Role is part of a multi-institutional project entitled "Respecting and Asserting First Nations Data Sovereignty in Research Data Management"
 - Bumped up from assistant role to join project lead/facilitation team from the First Nation Information Governance Centre, who are spear-heading the project
 - Co-leading project, co-facilitating multi-institution and multi-First Nations/Inuit dialogue meetings
 - Co-authoring final technical report
- 2022 **Memorial University, St John's, Newfoundland**
Research Writer CLEAR Lab – Dr Max Liboiron
- Reviewing various projects for completeness and identifying gaps
 - Editing manuscripts, preparing/editing figures, simple statistical analyses, preparing manuscripts for publication

- 2020 - **Waterways Canada** Winnipeg, Manitoba
 2021 **Grant writer**
- Two contracts to write grants for an Indigenous-led non-profit organization
 - Successful applications to >\$50,000 in funding for various community, land, and culture-based programs for Indigenous youth in Manitoba
- 2019 - **Science and Technology, Polar Knowledge Canada**
 2022 Cambridge Bay, Nunavut; Guelph, Ontario; Winnipeg, Manitoba
Research Assistant
- Seven contracts, full-time and part-time, based remotely or at the Canadian High Arctic Research Station
 - Assisting with field collections of plant phenology, insect ecology, botany, and remote sensing projects
 - Collecting freshwater invertebrate samples for my MSc and PhD; planning logistics for field collections
 - Training assistants in field and lab methods for freshwater invertebrate collections, sorting, preservation
 - Creating and leading youth workshops in partnership with the Kitikmeot Friendship Society
 - Databasing, identifying, processing, and plating specimens for DNA sequencing at the Centre for Biodiversity Genomics in Guelph
- 2017 - **Churchill Northern Studies Centre** Churchill, Manitoba
 2018 **Seasonal Research Technician**
- Providing logistical support for field and lab work in Manitoba's Sub-Arctic
 - Collected contract data for 15+ projects from a variety of disciplines
 - Polar bear guard for school groups, researchers, citizen scientists
 - Led international citizen science teams, conducted a pilot study on nutrient dynamics in Sub-Arctic tundra pond systems, and completed an Honours thesis on the same topic
- 2013 - **Honours Thesis** University of Winnipeg, Winnipeg, Manitoba
 2019 Advisors: Dr Nora Casson and Dr LeeAnn Fishback
- Completed a pilot project in 2017 to establish experimental protocols to investigate nutrient uptake in tundra ponds in Churchill, Manitoba
 - Completed a 4-month field season with in-situ experiments in 2018 to determine influences of sediment composition

and temperature in nutrient uptake in tundra pond systems in Churchill, Manitoba

- Wrote field/experiment and lab protocols for the project so I could teach other students, assistants, and international groups of citizen scientists
- Analyzed sediment samples for organic composition and water samples for nutrient (ammonium, phosphorus, nitrogen) concentration

Teaching Experience

- August 2023 **University of Guelph**, Grundy Lake Provincial Park, Ontario
Dr Jesse Popp and Dr Susan Chiblow
School of Environmental Science
- I was invited to assist on an honorarium basis with the field component of a second-year Bachelor of Indigenous Environmental Science and Practice course
 - I taught a Metis-style beadwork workshop to ~15 participants, spoke about my experience as an Indigenous graduate student in a Western scientific discipline, and participated in teachings from Elders
- June 2023 **University of Guelph, Kitikmeot Heritage Society, Kitikmeot Inuit Association** – Students on #STEAM
Co-Instructor, Cambridge Bay (Iqaluktuuttiaq), Nunavut
- Emily Angulalik and Elders in Residence, Margot, Burt**
Kitikmeot Heritage Society/Inuit Knowledge Keepers
- Dr Shoshanah Jacobs, Dr Tad McIlwraith, Dr Jess Clausen**
Integrative Biology/Anthropology/Lakehead University
- Co-instructed a 2-week holistic, on the land course targeting Inuit high school youth between grades 10-12; co-taught with Inuit Elders and Knowledge Keepers
 - Activities were loosely structured, guided by youth interests, weather, and which Elder/Knowledge Keeper was participating that day
 - Activities ranged from learning in various environmental areas (wetlands, tundra, lakes, ocean), traditional sewing and beadwork, and combining Inuit Knowledge and way of life (Inuit Qaujimagatuqangit) and Western scientific ways of knowing

- January **University of Guelph**, Guelph, Ontario
– April **Graduate Teaching Assistant**, Integrative Biology
- Taught 2-3 lab sections associated with BIOL-1080, “Discovering Biodiversity”, a first-year biology course
- 2020,
2021
- 20-25 students per section, in-person and virtually
 - Each section met once per week
 - Grading assignments (in-person and virtual), and proctoring exams (in-person)
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Publications

Technical reports

- 2020 **Nowosad, D.**, Hogg, I. and Adamowicz, S. (2020). Using DNA barcoding to inventory and track changes in the distribution and diversity of freshwater invertebrates in the Canadian Arctic. Aqhaliat 2020, Polar Knowledge Canada, p. 21-23 (in press).

Journal publications

- 2018 **Nowosad, D.** (2018) Rethinking the Foundations of Canada: From Historical Records to Life Experiences. The Case of Peter Fidler. Crossings, vol. 2, pp. 143-153.

Journal papers in review

- 2023 **Nowosad, D.**, Hogg, I., Cottenie, K., Lear, C., Adamowicz, S. (submitted, Polar Biology). High diversity of freshwater invertebrates on Inuinait Nuna, the Canadian Arctic, revealed using mitochondrial DNA barcodes.
- Nowosad, D.**, and Beattie, M. (submitted, Arctic Science). Inuit Qaujimaqatuqangit and Western Science: resilience using technology in the face of complex impacts from climate change.

Works in progress

- 2024 **Nowosad, D.**, Schaefer, P., Currie, D., Hogg, I., Cottenie, K., Steinke, D., Maksagak, B., deWaard, J., and Adamowicz, S. (expected submission June 2024 to Facets). Temporal black fly (Diptera: Simuliidae) species composition in northern Canada, a mix of published and novel data
- Nowosad, D.**, Aknavigak, K., Clausen, J. (expected submission August 2024). How can visiting researchers better support Inuit wellness? Case study in the Kitikmeot region of Nunavut.

Non-peer reviewed

- 2021 **Nowosad, D.** (2021). Arctic BIOSCAN: Tracking biodiversity in Canada's Middle Arctic using DNA. iBOL (International Barcode of Life) Bulletin Board. Online.

<https://ibol.org/barcodebulletin/illuminations/2021-25-05-dna-barcode-research-in-the-canadian-middle-arctic-that-works-to-include-indigenous-locals/>

Nowosad, D. (2021). Birding in Cambridge Bay. Canadian Section of The Wildlife Society Newsletter. 14(4).

2023

Nowosad, D. and Beattie, M. (2023). SciQ: A new approach to ethical research in the North. Canadian Geographic. Online. <https://canadiangeographic.ca/articles/sciq-a-new-approach-to-ethical-research-in-the-north/>

2024

Nowosad, D. (2024). Backcountry Arctic Science: Canoe Edition. Arctic Focus. Online. <https://www.arcticfocus.org/stories/backcountry-arctic-science-canoe-edition/>

July

2022

Community reports

- Delivered in-person and by email to the Hunter-Trapper Organizations in Cambridge Bay and Kugluktuk, Nunavut
- Reported sampling sites and protocols, preliminary results, knowledge mobilization strategies
- Answered project-specific questions from community members

April

2023

Conference Participation

- 2023 Using DNA barcoding to assess biodiversity of freshwater invertebrates on Inuinnait Nuna, or the Canadian Middle Arctic. Canadian Society for Ecology and Evolution Annual Scientific Meeting, Winnipeg, Manitoba. June 13 (talk)
- 2022 Using DNA barcoding to assess biodiversity of freshwater invertebrates on Inuinnait Nuna, or the Canadian Middle Arctic. ArcticNet Annual Scientific Meeting, Toronto, Ontario. Dec 7 (talk)
- Métis Experiences in Science. Mawachihitotaak: Let's Get Together Métis Symposium, online. Sept (talk)
- 2021 Building the reference library for freshwater invertebrates in the Canadian Middle Arctic. ArcticNet Annual Scientific Meeting, online. Dec 6 (poster)
- How can DNA barcoding be used to understand biodiversity and phylogeography of freshwater invertebrates in the Canadian Arctic? Canadian Association of Limnologists Annual Scientific Meeting, online. Feb (talk)
- 2020 Using DNA barcoding to assess biodiversity and phylogeography of freshwater invertebrates in the Canadian Arctic. ArcticNet Annual Scientific Meeting, online. Dec 6 (poster)
- DNA barcoding: what is it, and how it can be used in the Canadian Arctic?. American Indian Science and Engineering Society (AISES) international annual conference, online. Nov 14 (poster)
- Using DNA barcoding as a tool to understand biodiversity and phylogeography of freshwater invertebrates in the Canadian Arctic. Cold Regions Research Days, online. Oct (talk)
- 2019 Freshwater invertebrates in the Canadian Arctic: Using DNA barcoding to assess biodiversity, phylogeography, and ecological factors. ArcticNet Annual Scientific Meeting, Halifax, Nova Scotia. Dec 8 (poster)
- Freshwater invertebrates in the Canadian Arctic: Using DNA barcoding to assess biodiversity, phylogeography, and ecological factors. Annual Cold Regions Conference, Waterloo, Ontario. (poster)
- Effect of Seasonality and Sediment Properties on Rate of Nutrient Uptake in Tundra Pond Sediments. Canadian Association of Geographers Annual Conference, Winnipeg, Manitoba (talk)
- Effect of Seasonality and Sediment Properties on Rate of Nutrient Uptake in Tundra Pond Sediments, Prairie Biology University Symposium, Winnipeg, Manitoba (poster)

2018 Effect of Seasonality and Sediment Properties on Rate of Nutrient Uptake in Tundra Pond Sediments. High North Programme Symposium, Gjøvik, Norway (talk)

Effect of Seasonality and Sediment Properties on Rate of Nutrient Uptake in Tundra Pond Sediments. Randy Kobes Poster Competition, Winnipeg, Manitoba (poster)

Nutrient Uptake in Tundra Pond Sediments. Geography Honours Symposium, Winnipeg, Manitoba (talk)

Memberships

2022 – present Explorers Club
International organization dedicated to the advancement of field exploration and scientific inquiry

2022 – present Canadian Society for Ecology and Evolution

2018 – present American Indian Science and Engineering Society

Presentations and invited lectures

March 2024 **Respecting Indigenous Sovereignty Through Research Knowledge Management Strategies**
Indigenous Initiatives, University of Guelph

October 2023 **Ethical Research on Indigenous Land – How Do We Engage Communities When We Study “Uncharismatic” Animals?**
North American Symposium on Bat Research Annual Scientific Meeting, Winnipeg, Manitoba

September 2023 **Implementing Inuit guidelines for ethical research**
BIOL 6110 - Emerging Problems and Opportunities in Wildlife Biology, University of Guelph

August 2023 **Implementing Inuit guidelines for ethical research**
GEOG 3330 - Research Methods, University of Winnipeg

December 2022 **Building a genetic DNA library of freshwater invertebrates around Cambridge Bay, NU**
Grade 10 Biology students in Peel, Ontario

October 2022 **Indigenous inclusion in universities**
Centre for Innovation in Campus Mental Health

October 2022 **Knowledge Mobilization: Implementing Inuit guidelines for ethical research**
Environment and Climate Change Canada seminar series

September 2022 **Knowledge Mobilization: Implementing Inuit guidelines for ethical research**
Integrative Biology Departmental Seminar Series
University of Guelph

- June 2022 **Building a genetic DNA library of freshwater invertebrates around Cambridge Bay**
Canadian High Arctic Research Station Public Speaker Series, Cambridge Bay, Nunavut

 - May 2022 **Careers outside: Scientific research**
Sturgeon Heights Collegiate Outdoor Education class. Winnipeg, MB

 - May 2022 **Using DNA barcoding to understand biodiversity in Canada's North**
Canadian Parks and Wilderness Society, Manitoba chapter

 - February 2022 **Exploring freshwater biodiversity in the Arctic**
Live lesson via Explore By The Seat Of Your Pants

 - October 2021 **Arctic BIOSCAN freshwater invertebrates in Cambridge Bay**
Kiliniik High School Freshwater Biology class (in Cambridge Bay, NU)
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Professional training

- 2022 **Workshop**
Skills for research impact series: planning for research impact
University of Guelph, Guelph, Ontario

 - 2022 **Workshop**
Reproducible practices for Arctic research using R
Arctic Data Centre, California

 - 2021 **Workshop**
Introduction to geographic analyses of biodiversity
Transmitting Science, Spain

 - 2021 **Course**
Project Management graduate course
Partnership between the University of Guelph and the Community Engaged Scholarship Institute
University of Guelph, Guelph, Ontario
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Professional service

- 2023 – present **Peer-Reviewed Articles for:**
Conservation Biology

- 2022 – 2024 **Graduate Programs and Faculty Committee**
University of Guelph

- 2022 – 2024 **Centre for Indigenous Fisheries Advisory Council**
University of British Columbia

- 2022 **Session Co-Organizer**
ArcticNet Annual Scientific Meeting

- 2021 - 2022 **IAAC Indigenous-Science Knowledge Systems Engagement**
Departmental working group, Integrative Biology
University of Guelph

- 2019 – 2022 **English Communications Officer**
ArcticNet Student Association Executive Committee

Community service

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- 2023 - 2024 **Métis Harvesting Collective**
Co-lead, Winnipeg, Manitoba
 - Co-leading the Collective with two other Metis youth - \$20,000 in funding from Indigenous Youth Roots to plan and facilitate on-the-land traditional knowledge mobilization
 - We organize workshops with Métis Knowledge Keepers and Elders in Manitoba, and use the grant to offer workshops to Metis youth free of cost
 - 2 beading workshops, 5 trapping workshops, 2 fishing workshops, 1 guided hike

 - 2023 **Kitikmeot Friendship Society**
Freshwater Biodiversity Workshops
 - Workshop in Cambridge Bay, Nunavut at the Canadian High Arctic Research Station
 - Funded by the NSERC Indigenous Student Ambassador award and Polar Knowledge Canada, in partnership with the Kitikmeot Friendship Society, a local youth-oriented organization which delivers many social programs and day camps
 - Outdoor pond invertebrate collections and indoor microscope and identification component
 - Youth took custom-made colouring pages, transfer pipettes, plastic forceps, jars, and invertebrate stickers home
 - Donated all workshop materials (nets, hand microscopes, petri dishes, identification sheets and book) to the Kitikmeot Friendship Society for use in future youth programs

 - 2022 **Manitoba Métis Federation**
Métis Environmental Leaders of Tomorrow (MELT)

Freshwater Biodiversity Workshops

- Funded by NSERC Indigenous Student Ambassador award
- Workshops for ~60 youth delivered in Winnipeg, Brandon, and Grand Marais, Manitoba
- Created freshwater and bird workshops to integrate into *Métis* Environmental Leaders of Tomorrow (MELT) day camps, which are canoe, land, and culture-based
- Created a budget and purchased freshwater invertebrate sampling equipment, which was donated to the MELT program

2022

Polar Knowledge Canada and Kitikmeot Friendship Society

Freshwater Biodiversity Workshops

- 2 workshops run in Cambridge Bay, Nunavut at the Canadian High Arctic Research Station
- Funded by POLAR, in partnership with the Kitikmeot Friendship Society, a local youth-oriented organization which delivers many social programs and day camps
- Outdoor pond invertebrate collections and indoor microscope and identification component
- Youth took custom-made colouring pages, transfer pipettes, plastic forceps, jars, and invertebrate stickers home

Languages

English

Native language

Mentorship

2024-2025

Undergraduate Honours Thesis

- Olivia Colman, honours student BSc BioMed: *New DNA primer protocol for detection of O. cervipedis in Simuliidae adults*

2023

Undergraduate Student Research Assistants

Adamowicz Lab, University of Guelph

- Created and curated onboarding materials and project management plans tailored to two undergraduate students working full-time summer contracts
- Developed research projects aligned with interests and goals of each student, and aligns with

research interests outlined by the Hunter-Trapper Organizations in Kitikmeot

- Twice-weekly meetings to support students in skill development including citation management software, statistical software, data management, and more

2020 - 2022

College of Biological Sciences Undergraduate Mentorship Program (CoBUMP)

University of Guelph

- Mentor to one upper-year undergraduate student per winter semester
- Weekly meetings to discuss research interests, job opportunities, graduate school expectations
- Provided a living document of opportunities based on student's interests