

Christina R. Minions

christina.minions@gmail.com, (403) 804-9204
4822 Mills Drive, Anchorage AK 99508

EDUCATION

University of Alaska Anchorage

Anchorage, AK

MSc, Biology

May 2023

Graduate Research Assistantship

- Thesis: “*Experimental deepening of winter snowpack reduces fine root growth and standing crop at treelines in Northwest Alaska*”
- Co-Advisors: Dr. Patrick F. Sullivan, Dr. Matthew Carlson

St. Francis Xavier University

Antigonish, NS

BSc with Honors, Environmental Science - Biogeochemistry

May 2017

- Undergraduate thesis: “*Assessing temperature sensitivity of Alaskan soils using automated flux-concentrated measurements*”
- Advisor: Dr. Dave Risk

EMPLOYMENT HISTORY

Woodwell Climate Research Center

Falmouth, MA

Research Assistant (Remote)

November 2022 – Present

- Supporting research and working as part of a team to advance process understanding of permafrost thaw and wildfire effects on Arctic carbon cycling in the Yukon-Kuskokwim Delta, Alaska.
- Responsible for collecting data from the field, and managing, analyzing, and interpreting data, as well as assisting with manuscript development and editing.
- Coordinating field campaigns and managing field logistics for remote sampling campaigns.

Part-time Research Consultant (Remote)

January 2020 – October 2022

- Responsible for managing and maintaining the NASA ABoVE winter respiration stations located near Fairbanks, AK.
- Data management: processing and preparing dataset(s) for publication with the Oak Ridge National Lab DAAC.
- Assisting with manuscript development and editing.

Research Assistant (On-location)

May 2017 – May 2019

- Worked as part of a team to measure CO₂ emissions from arctic and boreal soils, with an emphasis in quantifying non-growing season carbon fluxes under the supervision of Dr. Sue Natali and Dr. Jennifer Watts.
- Responsibilities included designing and building gas flux chamber systems; programming data loggers; managing, analyzing, and interpreting data; coordinating field campaigns in Alaska to install and maintain equipment, collecting soil and vegetation data; laboratory work (soil sample analysis, vegetation sample sorting).

- Contributed to a meta-analysis project lead by Dr. Brendan Rogers examining seasonal amplitude of CO₂ concentrations in Arctic and Boreal zones. Responsibilities included reviewing literature, extracting data and statistical data analysis.

FLuxLab, St. Francis Xavier University

Lab Technician/Research Assistant

Antigonish, NS

September 2014 – May 2017

- Developed, and constructed automated systems to measure soil CO₂ respiration, and other meteorological parameters for different field campaigns. Other tasks in the lab included calibrating and testing equipment, preparing, and analyzing gas samples, and data analysis.

FIELD EXPERIENCE

Alaska, United States

Yukon-Kuskokwim Delta

Summer 2023

- 4-week campaign at a remote field camp southwest of Bethel, AK on the Yukon-Kuskokwim Delta. Working as a team to measure terrestrial fluxes, collect aquatic flux data and water samples, soil sampling, maintain and download data from Eddy covariance towers.

Brooks Range, Noatak National Preserve

Summers 2019, 2021, Winter 2020

- Two summer long campaigns (~3 months) at a remote field camp in the Western Brooks Range as part of project investigating treeline dynamics of white spruce (*Picea glauca*). Working in a team of two, spent the summer conducting terrestrial surveys of each site measuring needle gas exchange, branch extension, soil moisture and temperature, thaw depth, vegetation cover, collecting minirhizotron images, and soil samples.
- Weeklong winter campaign during late March 2020 to conduct site surveys measuring snowpack CO₂, digging snow pits to take temperature measurements and collect snow samples.

Various locations near Fairbanks and Toolik Field Station

2016 – 2023

- Multiple 2-3 weeklong summer field campaigns part of the NASA ABoVE winter respiration project. Built, tested, and deployed 8-fully automated systems to measure soil CO₂ respiration across Alaska, spanning both boreal and tundra ecosystems. Conducted terrestrial surveys of each site measuring above-ground biomass, thaw depth, organic layer depth, collecting soil and permafrost cores.
- Two, week-long field campaigns during the winter to sites located near the Fairbanks area to perform equipment maintenance and download data.
- 3-5 day trips to perform site checks and download data.
- Gained experience planning, organizing, and leading field campaigns.

Central and Northern Siberia, Russia

Chersky and Yakutsk

Summer 2017

- Three-week field campaign assisting on various projects. Tasks included soil sampling and analysis, measuring above-ground biomass and thaw depth, data entry, root sorting, and equipment take down at various sites.

Svalbard, Norway

Longyearbyen

Summer 2015

- Three-day field campaign to install automated CO₂ flux monitoring system, as part of a project examining the impact of tundra warming on soil respiration.

Saskatchewan and Northern British Columbia, Canada

Various Oil and Gas Facilities

Summer 2015

- Assisted on a two-week campaign performing surveys of remote oil and gas facilities to measure fugitive emissions (CO₂, CH₄, H₂S) using a vehicle-based technique.

Nova Scotia, Canada

Cape Breton Highlands

2014 – 2016

- Gained field experience through multiple site visits in both summer and winter conditions. Tasks included installing, managing, and removing meteorological stations, field testing automated CO₂ systems, installing snow-gas chambers, taking gas samples from snowpack, and snow coring.
- Completed a weeklong Environmental Field School course in 2016. The goal of the course was to develop a carbon budget for the Cape Breton Highlands National Park. Gained experience in collecting and analyzing lake and river water samples, digging soil pits, and sampling soils, and measuring above-ground biomass.

PUBLICATIONS

1. Watts, J.D., S.M. Natali, C. Minions, ... et al. (2021) Soil respiration strongly offsets carbon uptake in Alaska and Northwest Canada, *Environmental Research Letters*, 16, 084051. <https://doi.org/10.1088/1748-9326/ac1222>
2. Virkkala, A.-M, S.M. Natali, B.M. Rogers, J.D. Watts, ... C. Minions, ... et al. (2022) The ABCflux database: Arctic-boreal CO₂ flux observations and ancillary information aggregated to monthly time steps across terrestrial ecosystems, *Earth Syst. Sci. Data*, 14, 179-208. <https://doi.org/10.5194/essd-14-179-2022>
3. Minions, C., S. Natali, J.D. Watts, and S. Ludwig (2021) *ABOVE: Soil Temperature and VWC at Unburned and Burned Sites Across Alaska, 2016-2020*. ORNL DAAC, Oak Ridge, Tennessee, USA. <https://doi.org/10.3334/ORNLDAAC/1869>
4. Natali, S., J. Watts, ... Minions, C., ... et al. (2019) Large loss of CO₂ in winter observed across the northern permafrost region, *Nature Climate Change*, 9, 852-857.
5. Minions, C., S. Natali, J.D. Watts, S. Ludwig, and D. Risk (2020) *ABOVE: Year-Round Soil CO₂ Efflux in Alaskan Ecosystems, Version 2*. ORNL DAAC, Oak Ridge, Tennessee, USA. <https://doi.org/10.3334/ORNLDAAC/1762>
6. Atherton, E., D. Risk, C. Fougère, ... and C. Minions (2017) Mobile measurements of methane emissions from natural gas developments in Northeastern British Columbia, Canada, *Atmos. Chem. Phys.*, 17, 12405-12420. <https://doi.org/10.5194/acp-17-12405-2017>

PRESENTATIONS & WORKSHOPS

1. **AGU Fall Meeting (2022) & ICOP (2024)** *Implication of fire disturbance on soil carbon cycling and permafrost in black spruce forests of interior Alaska: a case study at Hess Creek* (poster)
2. **Arctic Science Summit Week (2021) & AGU Fall Meeting 2022** *Impact of increased seasonal snowpack on the fine root dynamics at treeline in the Western Brooks Range of Alaska* (poster)
3. **Arctic Data Center Data Science Training (January 2019)**
4. **NASA ABoVE Science Team Meeting (2018)** *Effect of soil moisture on the temperature sensitivity of Northern soils* (poster)
5. **NCEAS Working Group – Scientia Arctica: A Knowledge Archive for Discovery and Reproducible Science in the Arctic (2018)** Workshop meeting to collaborate, develop, and organize flux synthesis efforts
6. **AGU Fall Meeting (2017)** *Effect of soil moisture on the temperature sensitivity of Northern soils* (poster)
7. **Science Atlantic Environmental Conference (2017)** *Assessing temperature sensitivity of Alaskan soils using automated flux-concentration measurements* (oral)
8. **AGU Fall Meeting (2016)** *Temperature sensitivity of Alaskan tundra soils using automated flux-concentration measurements* (poster)
9. **Science Atlantic Environmental Conference (2016)** *Measuring CO₂ flux through a snowpack using an automated sampling method, Cape Breton Highlands, NS* (oral)

HONOURS & AWARDS

University of Alaska Anchorage

Graduate Research Assistantship

2019 – 2023

St. Francis Xavier University

First Class Honours

Spring 2017

Student Research Award

Spring 2017

Dean's List

2014 – 2016

In-Course Scholarship

2014, 2015, 2016

Entrance Scholarship

Fall 2013

SKILLS

Computer: R; Beginner Python; Google Workspace; Microsoft Office

Equipment: Programming and working with various Campbell Scientific dataloggers and meteorological sensors; using Onset HOBO meteorological loggers and sensors; Garmin GPS units; various LiCOR instruments

OUTREACH & VOLUNTEERING

Falmouth Science and Engineering Fair

2018, 2019

- Junior High Division volunteer judge (Falmouth, MA)

PolarTREC Program (Participant Researcher)

Summer 2018/Spring 2019

- Guided educator Kim Young (Weston High School) during field visits to ABoVE winter respiration sites in Alaska (Fairbanks area, Toolik Field Station) in the summer of 2018.
- Classroom visit at Weston High School - developed materials for Grade 9 students to learn about our Arctic research and permafrost.

Student Mentoring

2017 – 2019

- Assisted in advising a visiting high school student and undergraduate student at the Woodwell Climate Research Center. Guided students in various laboratory tasks including soil analysis and vegetation sampling protocols.