

# DAWSON PHAN

**PhD Student in Environmental Microbiology**  
*Bioinformatics, Data Analysis, Applied Problem Solving*

**Phone:**  
+1 (614) 353-1851

**Email:**  
phan.200@osu.edu

**LinkedIn:**  
<https://www.linkedin.com/in/dawsonphan/>

## SUMMARY

- PhD-level graduate student in Microbiology at The Ohio State University in Columbus, OH.
- Broadly interested in applying and developing quantitative methods to biological systems and studying ecosystem responses to environmental change.
- Seeking to specialize in viral and microbial eco-evolutionary controls on biogeochemical processes through shifts in metabolic states.
- Actively seeking opportunities to collaborate and integrate within interdisciplinary team science to tackle the world's most pressing environmental challenges such as climate change within soils, lakes, and oceans.

## EDUCATION

**The Ohio State University**, Columbus, OH, USA

Aug. 2023 – Present

- PhD in Microbiology, Graduate Minor in Computer Science – Artificial Intelligence Track
- **Co-advised** by Dr. Virginia Rich and Dr. Matthew Sullivan
- **Biological courses:** Microbial Physiology and Biochemistry, Microbiome Science & Informatics
- **Computational courses:** Machine Learning, Nonparametric Statistics, Deep Learning, Linear Optimization, Applied Bayesian Analysis, Computer Vision, Neural Networks

**McGill University**, Montreal, QC, Canada

2018 – 2022

- Bachelor of Science in Biology, minor Statistics
- **Selected bio-environmental courses:** Ecological Dynamics, Evolution, Physical Cell Biology, Plant Structure and Function, Earth System Processes, Geochemistry, Biological Oceanography, Genetics and Genomics
- **Selected computational courses:** Mathematical Probability & Statistics, Applied Regression, Design of Experiments, Generalized Linear Models, Time Series Analysis, Computer Programming in Physical Science & Engineering, Differential Equations, Applied Linear Algebra

**University of Waterloo**, Waterloo, ON, Canada

2019 – 2021

- Visiting student during Summer semesters

## SELECTED SKILLS

TECHNICAL	DISCIPLINARY	CONCEPTUAL
Programming (R, Python) Science communication (presentation design, interactive notebooks) Computational biology (microbial/viral)	Statistical learning & inference Ecology and evolution Aquatic ecology	Systems thinking Project management Mentorship and advising

# PUBLICATIONS

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Husk, B., Julian, P., Simon, D., Tromas, N., **Phan, D.**, Painter, K., Baulch, H., & Sauvé, S. (2024). Improving water quality in a hypereutrophic lake and tributary through agricultural nutrient mitigation: A Multi-year monitoring analysis. *In Journal of Environmental Management* (Vol. 354, p. 120411). Elsevier BV. <https://doi.org/10.1016/j.jenvman.2024.120411>

Douglas, P. M. J., Stratigopoulos, E., Park, S., & **Phan, D.** (2021). Geographic variability in freshwater methane hydrogen isotope ratios and its implications for global isotopic source signatures. *Biogeosciences* (Vol. 18, Issue 11, pp. 3505–3527). Copernicus GmbH. <https://doi.org/10.5194/bg-18-3505-2021>

# GRANTS, HONORS AND AWARDS

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<u>UNDERGRADUATE: Amounts are in CAD</u>	
Science Undergraduate Research Award (SURA, \$7000)	2022
Earth and Planetary Sciences Undergraduate Research Symposium Audience Award (\$50)	2021
Tomlinson Engagement Award for Mentoring (TEAM, \$300 per course offering)	2020 – 2021
J. W. McConnell Scholarship (\$3000/year)	2018 – 2020
Libro Credit Union Student Award (\$2000)	2018 – 2019

# RESEARCH EXPERIENCE

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<u>GRADUATE</u>	
<b>Viral &amp; Microbial Ecology Labs:</b> Graduate Research Associate, The Ohio State University	Aug. 2023 – Present
<ul style="list-style-type: none"><li><b>Thesis Theme 1:</b> Comparative metabolic ecology of viruses and microbes between terrestrial and oceanic systems through multiomics and modeling approaches</li><li><b>Thesis Theme 2:</b> Statistical and machine learning algorithmic development of methods for microbiome informatics</li><li><b>Mentors:</b> Dr. Virginia Rich, Dr. Matthew Sullivan</li></ul>	
<u>POST-BACCLAUREATE</u>	
<b>Microbial Ecology Lab:</b> Research Consultant, The Ohio State University	Jan. 2023 – Aug. 2023
<ul style="list-style-type: none"><li><b>Project:</b> Semi-quantitative statistical analysis of metatranscriptome and metaproteome data across microbial communities from a permafrost thaw gradient</li><li><b>Mentors:</b> Dr. Virginia Rich, Dr. Ahmed Zayed</li></ul>	
<u>UNDERGRADUATE</u>	
<b>Land &amp; Food Lab:</b> Research Assistant, McGill University	May 2022 – Aug. 2022
<ul style="list-style-type: none"><li><b>Project:</b> Conducted time series statistical analyses of global food trade data since 1960 to observe periods of significant change correlated to historical events</li><li><b>Mentors:</b> Dr. Graham MacDonald</li></ul>	

# RESEARCH EXPERIENCE

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## UNDERGRADUATE

**Microbial Eco-evolutionary Genomics Lab:** Research Assistant, McGill University May 2021 – Apr. 2022

- **Project 1:** Applied existing bioinformatic tools to use Lotka-Volterra models to understand the potential viral controls for cyanobacterial blooms
- **Project 2:** Conducted statistical analyses of a 10-year time series studying the impact of agricultural interventions on the eutrophication status of a lake
  - Resulted in *submission* of publication
- **Mentors:** Dr. Jesse Shapiro, Dr. Nicolas Tromas

**Theoretical Ecology Lab:** Undergraduate Research Course, McGill University May 2021 – Aug. 2021

- **Project:** Conducted temporal and spatio-temporal statistical modeling comparing phyto- and zooplankton community structure in the Baltic Sea from 2000-2020
- **Mentors:** Dr. Frederic Guichard

**Stable Isotope Geochemistry Lab:** Undergraduate Research Course, McGill University May 2020 – Aug. 2020

- **Project:** Conducted statistical analyses of 897 methane isotope compositions compiled from 40 studies to compare differences between freshwater environments. Modelled the atmospheric composition of methane attributed to this data and a global gas geochemistry inventory to understand source contributions.
  - Resulted in publication
- **Mentors:** Dr. Peter Douglas

**Palaeontology and Evo-Devo Biology Lab:** Laboratory Assistant, McGill University Jan. 2020 – Mar. 2020

- **Project:** Assessment of chicken-embryo CT scales treated with or without microplastic treatments to assess for defects in development
- **Mentors:** Dr. Hans Larsson

**Stochastic Processes Lab:** Research Assistant, University of Waterloo Mar. 2017 – Jun. 2017

- **Project:** Conducted simulations to compare probability implications of several drug testing procedures using the Gambler's Ruin problem as inspiration
- **Mentors:** Dr. Steve Drekić

# TEACHING EXPERIENCE

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## UNDERGRADUATE

**Teaching Assistant,** McGill University Aug. 2020 – Dec. 2021

- Assisted in discussion & tutorial instruction for GEOG 203 Environmental Systems to introduce students to quantitative principles of understanding climate change using R and Excel data analysis
- Funded under Tomlinson Engagement Award for Mentorship (TEAM) to provide senior undergraduate students with teaching experience

# LEADERSHIP EXPERIENCE

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<b>VP Administration</b> , McGill Biology Student Union	2021 – 2022
<ul style="list-style-type: none"><li>• Logistical support for event planning and execution for undergraduate Biology community including social, academic, and career topics</li><li>• Mentorship and curriculum improvement/advocation for Biophysical Science majors</li></ul>	
<b>Biology and Mathematics Representative</b> , McGill Integrative Bioscience Society	2021 – 2022
<ul style="list-style-type: none"><li>• Represented Biology and Mathematics interests in Biophysical Science program communications and events</li></ul>	

# MENTORSHIP EXPERIENCE

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<u>UNDERGRADUATE</u>	
<b>BRANCHES Mentorship Program</b> , McGill University Student Recruitment	Mar. 2021
<ul style="list-style-type: none"><li>• Mentorship to high school students with under-privileged backgrounds to increase exposure and resources for post-secondary pathways</li></ul>	
<b>Peer-mentorship</b>	
<ul style="list-style-type: none"><li>• Brian Schatteman</li></ul>	2021 – 2022
<ul style="list-style-type: none"><li><ul style="list-style-type: none"><li>○ Mentored as part of a departmental program to expose junior biology undergraduate students to opportunities with senior students with aligned interests (quantitative environmental biology)</li></ul></li></ul>	
<ul style="list-style-type: none"><li>• Theodor Constantin</li></ul>	2020 – 2022
<ul style="list-style-type: none"><li><ul style="list-style-type: none"><li>○ Mentored as part of a university program to help new undergraduate students navigate the challenges of starting university</li></ul></li></ul>	

# TRAININGS

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<b>QLife: Quantitative Seascape Ecology of Marine Plankton</b> , École normale supérieure	Mar. 2024
<ul style="list-style-type: none"><li>• Training conducted by expert leaders in Quantitative Marine Plankton Ecology, including lectures and sessions on:<ul style="list-style-type: none"><li>○ Quantitative imaging</li><li>○ Species community network analysis</li><li>○ Macroevoolutionary models for species diversification</li><li>○ Metabolic community modeling</li></ul></li></ul>	
<b>EMERGE Summer Program</b> , EMERGE Biology Integration Institute	2023 – 2024
<ul style="list-style-type: none"><li>• Early career researcher-focused training on:<ul style="list-style-type: none"><li>○ Foundational science literacy to study climate change</li><li>○ Team Science, Mentorship &amp; Science Communication</li><li>○ Diversity, Equity and Inclusion</li></ul></li></ul>	
<b>SciComm: The Essence of Storytelling</b> , Dr. Jaime Jacobsen, Colorado State University	Apr. 2023
<ul style="list-style-type: none"><li>• Workshop on communicating science through social media engagement</li></ul>	