DAWSON PHAN

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

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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	DISCPLINARY	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

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

UNDERGRADUATE: *Amounts are in CAD*

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

GRADUATE

Viral & Microbial Ecology Labs: Graduate Research Associate, The Ohio State University — Aug. 2023 – Present

- **Thesis Theme 1:** Comparative metabolic ecology of viruses and microbes between terrestrial and oceanic systems through multiomics and modeling approaches
- **Thesis Theme 2:** Statistical and machine learning algorithmic development of methods for microbiome informatics
- **Mentors**: Dr. Virginia Rich, Dr. Matthew Sullivan

POST-BACCLAUREATE

Microbial Ecology Lab: Research Consultant, The Ohio State University — Jan. 2023 – Aug. 2023

- **Project:** Semi-quantitative statistical analysis of metatranscriptome and metaproteome data across microbial communities from a permafrost thaw gradient
- **Mentors**: Dr. Virginia Rich, Dr. Ahmed Zayed

UNDERGRADUATE

Land & Food Lab: Research Assistant, McGill University — May 2022 – Aug. 2022

- **Project:** Conducted time series statistical analyses of global food trade data since 1960 to observe periods of significant change correlated to historical events
- **Mentors**: Dr. Graham MacDonald

RESEARCH EXPERIENCE

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 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 Drekic

TEACHING EXPERIENCE

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

VP Administration, McGill Biology Student Union 2021 – 2022

- Logistical support for event planning and execution for undergraduate Biology community including social, academic, and career topics
- Mentorship and curriculum improvement/advocation for Biophysical Science majors

Biology and Mathematics Representative, McGill Integrative Bioscience Society 2021 – 2022

- Represented Biology and Mathematics interests in Biophysical Science program communications and events

MENTORSHIP EXPERIENCE

UNDERGRADUATE

BRANCHES Mentorship Program, McGill University Student Recruitment Mar. 2021

- Mentorship to high school students with under-privileged backgrounds to increase exposure and resources for post-secondary pathways

Peer-mentorship

- Brian Schatteman 2021 – 2022
  - Mentored as part of a departmental program to expose junior biology undergraduate students to opportunities with senior students with aligned interests (quantitative environmental biology)
- Theodor Constantin 2020 – 2022
  - Mentored as part of a university program to help new undergraduate students navigate the challenges of starting university

TRAININGS

QLife: Quantitative Seascape Ecology of Marine Plankton, École normale supérieure Mar. 2024

- Training conducted by expert leaders in Quantitative Marine Plankton Ecology, including lectures and sessions on:
  - Quantitative imaging
  - Species community network analysis
  - Macroevolutionary models for species diversification
  - Metabolic community modeling

EMERGE Summer Program, EMERGE Biology Integration Institute 2023 – 2024

- Early career researcher-focused training on:
  - Foundational science literacy to study climate change
  - Team Science, Mentorship & Science Communication
  - Diversity, Equity and Inclusion

SciComm: The Essence of Storytelling, Dr. Jaime Jacobsen, Colorado State University Apr. 2023

- Workshop on communicating science through social media engagement