Bennett McAfee

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LinkedIn
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Education

University of Wisconsin–Madison, Madison, WI — Jan 2023 – In Progress
Master of Science | Freshwater and Marine Sciences
Advisor: Dr. Paul Hanson, Committee: Dr. Cayelan Carey, Dr. Gretchen Gerrish
Cumulative GPA: 4.00
Related coursework: Lake Metabolism, Ecosystem Concepts, Abrupt Ecological Change, Estuary Management

Lawrence University, Appleton, WI — Sept 2017 – June 2021
Bachelor of Arts | Biology with minors in Film Studies and Government
Advisor: Dr. Bart De Stasio, Committee: Dr. Judith Humphries, Dr. Andrew Sage
Major GPA 3.85, Cumulative GPA 3.75
Phi Beta Kappa, *magna cum laude* in course, *magna cum laude* in independent study, Dean's List all terms 2017-2021
Related coursework: Experimental Design and Statistics, Aquatic Ecology, Coral Reef Environments, Animal Behavior, Principles of Chemistry, Microbiology, Genetics, Ecological Modelling, and Statistics for Data Science.

Professional and Work Positions

Graduate Research Assistant — Jan 2023 – Present
Center for Limnology, University of Wisconsin–Madison

Data Curator — Jan 2023 – Present
Environmental Data Initiative

Research Technician — Apr 2022 – Nov 2022
Trout Lake Station, Center for Limnology, University of Wisconsin–Madison

Quality Coordinator — Aug 2021 – Apr 2022
Water Quality Association [contract via Actalent]

Content Tutor — Jan 2021 – June 2021
Center for Academic Success, Lawrence University

Lab Assistant — Sept 2020 – Feb 2021
Department of Biology, Lawrence University

Student Research Fellow — June 2020 – Aug 2020
Department of Biology, Lawrence University
Trout Lake Station, Center for Limnology, University of Wisconsin–Madison

Thesis

McAfee, B. J., (2021). *Programming Simulations of Diel Vertical Migration Behavior of Zooplankton* (157) [Lawrence University]. Lawrence University Honors Projects. https://lux.lawrence.edu/luhp/157

Presentations

Oral

McAfee, B., Ladwig, R., Neog, A., Carey, C., Karpatne, A., Daw, A., & Hanson, P. (2024, June 5). *ADVANCING UNDERSTANDING OF LAKE WATER QUALITY THROUGH TIME WITH MODULAR COMPOSITIONAL LEARNING* [Oral presentation]. ASLO 2024 Meeting, Madison, WI, USA.

McAfee, B., Gorsky, A., Krask, J., & Dunn, R. (2024, May 8). *Nutrient dynamics in the North Inlet-Winyah Bay National Estuarine Research Reserve* [Oral presentation]. Ecosystem Dynamics & Trends Across Seven National Estuarine Research Reserves, Online event.

McAfee, B. (2024, February 14). *Advancing Understanding of Lake Water Quality Across Space and Time with Modular Compositional Learning* [Oral presentation]. Limnology and Marine Science Seminar, University of Wisconsin–Madison, Madison, WI, USA.

McAfee, B. (2020, October 31). *Programming Simulations of Diel Vertical Migration Behavior of Zooplankton* [Oral presentation]. Midstates Consortium for Math and Science, Online event.

Posters

McAfee, B., Ladwig, R., Carey, C., Karpatne, A., Lofton, M., Neog, A., Daw, A., Skoglund, S., & Hanson, P. (2024, February 8). *Understanding Water Quality Dynamics of the Lake Water Column using Modular Compositional Learning* [Poster presentation]. NSF Macrosystems Biology Community Virtual Meeting, Online event. https://doi.org/10.5281/zenodo.10659628

McAfee, B., Ladwig, R., Carey, C., Karpatne, A., Lofton, M., Daw, A., Neog, A., Skoglund, S., & Hanson, P. (2023, November 7). *Advancing Understanding of Lake Metabolism using Modular Compositional Learning* [Poster presentation]. Water@UW-Madison 2023 Fall Art & Science Poster Session, Madison, WI, USA. https://doi.org/10.5281/zenodo.8287788

McAfee, B., Ladwig, R., Carey, C., Karpatne, A., Lofton, M., Daw, A., Neog, A., Skoglund, S., & Hanson, P. (2023, August 23). *Advancing Understanding of Lake Metabolism using Modular Compositional Learning* [Poster presentation]. [redacted]

McAfee, B. (2021, May 15). *A Light or Depth Situation: Modelling the Vertical Migration of Daphnia* [Poster presentation]. Biofest, Lawrence University, Online event.

Co-Authored Presentations

Yu, H. H., **McAfee, B.**, & Hanson, P. (2024, June 28). *Predicting Dissolved Oxygen Dynamics in Lake Mendota Using Transfer Learning* [Poster presentation]. Cellular & Molecular Biology of Stress Summer Research Program Poster Session, University of Wisconsin–Madison, Madison, WI, USA.

Skoglund, S., Oo, M., Heberlein, B., Kibler, K., Schlimm, H., Sustachek, J., **McAfee, B.**, McMahon, K., Townsend, P., Holz, R., Wilkinson, G., & Hanson, P. (2024, June 5). *LAKEVIEW: NEW UNDERSTANDING OF LAKE WATER QUALITY THROUGH INTEGRATED EARTH OBSERVING SYSTEMS* [Oral presentation]. ASLO 2024 Meeting, Madison, WI, USA.

De Stasio, B., **McAfee, B.**, Jankowski, M., Johnson, M., Lavajo, L., Meng, E., Petty, M., Schroeder, B., & Gerrish, G. (2024, June 5). *BOTTOM-UP DRIVEN DIEL VERTICAL MIGRATION: SIZE AND SPECIES MATTERS* [Oral presentation]. ASLO 2024 Meeting, Madison, WI, USA.

Hanson, P., Carey, C., Daw, A., Dugan, H., Jia, X., Karpatne, A., Khandelwal, A., Ladwig, R., Lofton, M., **McAfee, B.**, Neog, A., Read, J., Skoglund, S., Weathers, K., & Kumar, V. (2024, June 4). *KNOWLEDGE GUIDED MACHINE LEARNING ADVANCES THE SCIENCE OF LIMNOLOGY* [Oral presentation]. ASLO 2024 Meeting, Madison, WI, USA.

R Packages

McAfee, B. (2023). EDIutilsAddons: Additional functions for interacting with the Environmental Data Initiative repository. R Package version 0.1.5. https://github.com/bmcafee/EDIutilsAddons

McAfee, B. (2022). ZoopCounter: Opens a tally counter designed for counting Zooplankton, but can be used for any tallying purposes. Use ZoopCounter() with a list of names to create a window with the counter. Use and edit keyboard shortcuts to make counting faster. R Package version 0.1.0. https://github.com/bmcafee/ZoopCounter

Licenses and Certifications

Open Water Diver Sept 2019 – non-expiring
Professional Association of Diving Instructors (PADI)

First Aid CPR AED Sept 2022 – May 2026
American Red Cross Training Services (May 2024-May 2026)
American Heart Association (Sept 2022-Sept 2024)

Boater Safety Education Apr 2022 – non-expiring
National Association of State Boating Law Administrators
Wisconsin Department of Natural Resources

Research, Field, Lab, and Technical Experience

Select Research Projects

Ecology Knowledge-Guided Machine Learning Jan 2023 – Present
Role: Graduate student researcher
Institution(s): University of Wisconsin–Madison Center for Limnology, Virginia Tech
Description: Utilized modular compositional learning to model water quality in Lake Mendota (Dane County, WI) to investigate spatial and temporal variance in ecosystem processes including lake metabolism. Also harmonized multiple long-term datasets of lake water quality to create a training dataset for transfer learning experiments and creating a foundation model of lake water quality.

NTL-LTER Lake Phenology Project Apr 2022 – Nov 2022
Role: Research technician
Institution(s): University of Wisconsin–Madison Center for Limnology Trout Lake Station, North Temperate Lakes Long-Term Ecological Research program
Description: Collected and analyzed zooplankton community and water quality data in two lakes in Vilas County, WI to understand the effects of ice-off timing on various biotic and abiotic characteristics of lake systems.

Diel Vertical Migration (DVM) Project June 2020 – June 2021
Role: Undergraduate researcher (former), collaborator
Institution(s): Lawrence University, University of Wisconsin–Madison Center for Limnology Trout Lake Station
Description: Used stochastic dynamic programming to model the diel vertical migration behavior of *Daphnia* to understand the influence of various biotic and abiotic characteristics of the system on zooplankton behavior. This led to field experiments of the influence of trophic status on diel vertical migration.

Lake^{View} Hyperspectral Imaging of Lakes Oct 2023 – Present
Role: Assisting graduate student
Institution(s): University of Wisconsin–Madison Center for Limnology
Description: Sampled lake water quality and microbial communities in situ in Lake Mendota (Dane County, WI) while an airplane equipped with a hyperspectral imaging camera monitored the lake from the air. This prepares us to interpret the hyperspectral data from remote sensing satellite technologies currently being launched.

Skills Summary

Technical and Software: R, Python, Git and GitHub, Google Earth Engine, ImageJ, Microsoft Access, Microsoft Excel, Oxygen XML Editor

Field and Equipment: multiparameter water quality sonde (YSI and HYDROLAB), Wisconsin net, Schindler trap, PAR sensor, Van-Dorn, Kemmerer, integrated water sampler, peristaltic pump, stream flow rate measurement, macroinvertebrate netting, backpack electrofishing, boat electrofishing, fyke net deployment and retrieval, fish handling, fish identification, macrophyte identification, macroinvertebrate identification, air quality sensors, motorized boat operation and maintenance, snorkeling, SCUBA

Laboratory: microscopy, spectrophotometer, CyanoFluor HAB Indicator, sample specimen preservation, zooplankton identification, microbial mesocosms, laboratory animal care (fish, zooplankton, zebra mussels)

Additional Research, Field, and Lab Experiences

Spiny water flea effect on DVM in Lake Mendota (Dane County, WI)	25-26 June 2024
ZOOLOGY 511: Ecology of Fishes Lab at UW–Madison	29 Mar 2024
Mercury in the microbial food web of Lake Mendota (Dane County, WI)	2-3 Oct 2023
Satellite remote sensing of algal blooms in Lake Superior with GEE	6-8 July 2023
Littoral habitat sampling after water level rise in Fish Lake (Dane County, WI)	22 June 2023
Spatial heterogeneity of water quality in Lake Wingra (Dane County, WI)	28 Mar 2023
NTL-LTER macroinvertebrate sampling	6-7 Oct 2022
Mudpuppy surveys in Trout Lake (Vilas County, WI)	July – Aug 2022

NTL-LTER electrofishing 27-28 July 2022
WDNR perch population estimation in two lakes (Vilas County, WI) 17 May 2022
BIOLOGY 330: Aquatic Ecology at Lawrence University Sep – Nov 2019

Awards

C-R Birge Graduate Travel Award ($1,490 total) 22 Feb 2024, 29 May 2024
Center for Limnology, University of Wisconsin–Madison

Service

SCUBA Committee, member Sept 2023 – Present
Center for Limnology, University of Wisconsin–Madison

Limnology and Fisheries Society, co-chair Sept 2023 – June 2024
Center for Limnology, University of Wisconsin–Madison

Seminar & Kaeser Scholar Committee, co-chair June 2023 – May 2024
Center for Limnology, University of Wisconsin–Madison

Trout Lake Station Use & Climate Committee, member Sept 2022 – May 2023
Center for Limnology, University of Wisconsin–Madison

Outreach

Professional

EDI & LTER Network exhibitor booth, ESA 2023 Annual Meeting 7-11 Aug 2023
Clean Lakes Alliance water quality monitoring training event 24 May 2023

Public

Hasler Lab Open House (2024) 21 June 2024
Wisc. EcoLatinos El día de la Tierra Bilingual Environmental Conservation Fair 20 Apr 2024
UW–Madison Science Expeditions 5 Apr 2024
Hasler Lab Open House (2023) 23 June 2023
Trout Lake Station Open House 29 July 2022
Lac du Flambeau Annual Lakes Fest 18 June 2022

Professional Memberships

Association for the Sciences of Limnology and Oceanography Feb 2024 - Present

Professional References

Dr. Paul Hanson
Distinguished Research Professor
Center for Limnology, University of Wisconsin–Madison
608-320-5322
pchanson@wisc.edu
Note: Served as my academic advisor for my master's thesis

Dr. Gretchen Gerrish
Director of Trout Lake Station
Center for Limnology, University of Wisconsin Madison
608-890-4763
ggerrish@wisc.edu
Note: Served as my employer for two summers at Trout Lake Station, and a committee member for my master's thesis.

Dr. Bart De Stasio
Dennis and Charlot Nelson Singleton Professor of Biological Sciences and Professor of Biology
Lawrence University
920-832-6727
bart.t.destasio@lawrence.edu
Note: Served as my academic advisor, teacher, and employer throughout my undergraduate coursework, and a collaborator throughout my graduate career.