Morgan Botrel
morganbotrel@gmail.com, morganbotrel.weebly.com
Montréal, QC

Education

2015-2022[1] Ph.D. biological sciences, Université de Montréal (UdeM)
Advisors: Dr. Roxane Maranger, cosupervised by Dr. Pascale Biron and Dr. Christiane Hudon
Thesis: "Submerged aquatic vegetation in inland waters: response to environmental changes and consequences on ecosystem functioning"
Graded as outstanding

2009-2012 M.Sc. biological sciences, UdeM
Advisors: Dr. Roxane Maranger, cosupervised by Dr. Irene Gregory-Eaves
Thesis: "Characterization of nitrogen sources and cycling in temperate lakes using stable isotopes"

2003-2007 B.Sc. major geography, minor biological sciences, UdeM

Research and teaching experience[2]

2011-2022 Limnology field course, department of biological sciences, UdeM
- Lecturer (2022)
- Chief teaching assistant (2011, 2016, 2017)
- Teaching assistant (2010, 2020, 2021)

2018-2021 Limnology course, department of biological sciences, UdeM
- Lecturer (2018)
- Teaching assistant (2020 & 2021)

2020 Lecturer, Horizon class: Risks and challenges of the 21st century, Faculté des arts & des sciences, UdeM
Create and give an interdisciplinary class using inquiry-based learning to answer the question: "How can we limit global warming in a context of skepticism and indifference toward science?"

2019 Cocreation of a boreal lake ecology intensive class, EcoLac program (NSERC CREATE), Station de biologie des Laurentides

2018 Intern in ecosystem ecology, Duke University, Emily S. Bernhardt laboratory

2018 Aquatic ecologist specialist, Environment and Climate Change Canada, St. Lawrence Centre, supervised by Christiane Hudon

2010 & 2015 Teaching assistant, Oceanography, department of biological sciences, UdeM

2012-2014 Research coordinator, Groupe de recherche interuniversitaire en limnologie (GRIL)
Execute two research projects with 30 researchers: prepare and conduct field and laboratory work, maintain databases, train and supervise assistants, manage budgets and communicate with researchers.

2011 Intern in isotopic analysis, University of Massachusetts Dartmouth, Mark. A. Altabet laboratory

2008-2009 Research assistant in paleolimnology, McGill University, Irene Gregory-Eaves laboratory

Scholarships

2021 J.-A. DeSève scholarship, Études supérieures et postdoctorales, UdeM (8,000 CA$)

2019-2020 Fellow HORizon Louis Gagnon fellowship, Faculté des arts et des sciences, UdeM (24,000$)

2017-2019 Alexander Graham Bell Canada graduate scholarship (CGS D), NSERC (70,000 CA$)

---

[1] 5.4-year full-time equivalent (maternity leave from September 2019 to September 2020, and interruption for bereavement in fall 2020; disruption from COVID not considered)
[2] Maternity leave from July 2014 to August 2015

2015-2017 Research doctorate scholarship, FRQNT (60,000 CA$, declined in 2017)

2015-2018 ÉcoLac intern, NSERC CREATE training program (15,000 CA$)

Peer-reviewed publications

In review

Botrel, M., C Hudon, PM Biron, R Maranger. Combining quadrat, rake and echosounding to estimate submerged aquatic vegetation biomass at the ecosystem scale. *Limnology and Oceanography: Methods*. Preprint available on BioRxiv https://doi.org/10.1101/2022.03.15.484486

Dupont, A, **M Botrel**, NF St-Gelais, T Poisot, R Maranger. A social-ecological biogeography of Canadian lakes. *Facets*

Accepted

Botrel, M & R Maranger. Global historical trends and drivers of submerged aquatic vegetation quantities in lakes. *Global Change Biology*

Published

Goyette, J-O, **M Botrel**, G Billen, J Garnier, R Maranger. 2023. Agriculture specialization influence on nutrient use efficiency and fluxes in the St. Lawrence Basin over the 20th century. *Science of the Total Environment* 159018. https://doi.org/10.1016/j.scitotenv.2022.159018

Botrel, M, C Hudon, JB Heffernan, PM Biron, R Maranger. 2022. Climate-driven variation in nitrogen retention from a riverine submerged aquatic vegetation meadow*. *Water Resources Research* E2022WR032678. https://doi.org/10.1029/2022WR032678
*Selected as an Eos Research Spotlight: Sidik, SM. 2022. High-frequency monitoring reveals riverine nitrogen removal, *Eos*, 103, https://doi.org/10.1029/2022EO220510. Published on October 25, 2022

Charrier-Tremblay, C, **M Botrel**, J-F Lapierre, R. Maranger. 2019. Relative influence of watershed and geomorphic features on nutrient and carbon fluxes in a pristine and moderately urbanized stream. *Science of the Total Environment* 13641. https://doi.org/10.1016/j.scitotenv.2019.136411

Bulat, M, PM Biron, JRW Lacey, **M Botrel**, C Hudon, R Maranger. 2019. A three-dimensional numerical model investigation of the impact of submerged macrophytes on flow dynamics in a large fluvial lake. *Freshwater Biology* 64:1627-1642. https://doi.org/10.1111/fwb.13359

Massé S, **M Botrel**†, D Walsh, R Maranger. 2019. Annual nitrification dynamics in a seasonally ice-covered lake. *PLOS One*. https://doi.org/10.1371/journal.pone.0213748 †corresponding author

Botrel, M, MA Altabet, L Bristow, I Gregory-Eaves, R Maranger. 2017. Assimilation and nitrification in pelagic waters: insights using dual nitrate stable isotopes ($\delta^{15}N$, $\delta^{18}O$) in a shallow lake. *Biogeochemistry* 135(3): 221-237. https://doi.org/10.1007/s10533-017-0369-y

Botrel, M, I Gregory-Eaves et R Maranger. 2014. Defining drivers of nitrogen stable isotopes ($\delta^{15}N$) of surface sediments in temperate lakes. *Journal of Paleolimnology* 52(4): 419-433. https://doi.org/10.1007/s10933-014-9802-6

Chen, G, DT Selbie, K Griffiths, JN Sweetman, **M Botrel**, ZE Taranu, S Knops, J Bondy, N Michelutti, JP Smol, I Gregory-Eaves. 2014. Proximity to ice fields and lake depth as modulators of paleoclimate records: a regional study from southwest Yukon, Canada. *Journal of Paleolimnology* 52(3): 185-200. https://doi.org/10.1007/s10933-014-9787-1

Datasets

Botrel, M, R Maranger. 2022. Data on global trends and drivers of submerged aquatic vegetation quantities in lakes. *Zenodo*. https://doi.org/10.5281/zenodo.6502355

Botrel, M, A Bertolo, R Maranger. 2022. Data on submerged aquatic vegetation and its water environment in Lake Saint-Pierre, Saint Lawrence River, from 2012 to 2016. *Zenodo*. https://doi.org/10.5281/zenodo.6784490

Botrel, M, C Hudon, PM Biron, R Maranger. 2022. Submerged aquatic vegetation and nitrogen retention data from 2012 to 2017 in lake Saint-Pierre, Saint Lawrence River (Version 2). *Zenodo*. https://doi.org/10.5281/zenodo.7052193

Botrel, M, C Hudon, PM Biron, R Maranger. 2021. Submerged aquatic vegetation data from the Saint Lawrence River (2006-2016) to compare biomass estimation from quadrat-diver technique to rake collection and echosounding. *Zenodo*. https://doi.org/10.5281/zenodo.5548402

Botrel, M. 2019. Lake Croche data from 2011 and 2012. *Figshare*. https://doi.org/10.6084/m9.figshare.7640648.v1

Social and scientific involvement

2021	Organization and animation of COVID Connections, virtual working groups with participants from around the globe, Association for the Sciences of Limnology and Oceanography (ASLO)
2017-2019	Student representative, GRIL
2011-2017	Creation and animation of outreach activities - Aquatic critters: linking shape to function, 24 hours of science (2017) - The pathway of water, from the toilet to the St. Lawrence, Eurêka Festival (2016) - The unrecognized life of lakes and streams, 24 hours of science (2011 & 2012)
2016	Conference organizer, Forum environnement, UdeM
2015-2016	Secretary, Association des étudiants-chercheurs en biologie de l'UdeM
2009-2012	Student representative, Society of Canadian Limnologists (SCL)

Selected presentations at conferences

Oral presentation if not otherwise mentioned

Botrel, M, R Maranger. June 2022. Global historical trends and drivers of submerged aquatic vegetation in lakes. Joint Aquatic Sciences Meeting (JASM), Grand Rapids, MI, US (virtual presentation)

Botrel, M, C. Hudon, JB Heffernan, R Maranger. June 2021. Interannual variation in growth of submerged aquatic vegetation mediates nitrogen retention in a large river. ASLO virtual meeting

Botrel, M, C Hudon, PM Biron, R Maranger. June 2018. Influence of climate variability on nitrate retention in a riverine submerged aquatic vegetation bed. ASLO, Victoria, BC, USA

Botrel, M, C Hudon, JB Heffernan, PM Biron, R Maranger. May 2021. Variations interannuelles de la rétention de l'azote dans les herbiers aquatiques au Lac Saint-Pierre, fleuve Saint-Laurent. Association francophone pour le savoir (ACFAS), virtual meeting

Botrel, M, S Bédard, R Maranger. January 2017. Global historical trends in inland water submerged macrophytes. SCL meeting, Montréal, QC, CA. Poster presentation

Botrel, M, C Hudon, P Bolduc, A Bertolo, P Gagnon, R Maranger. March 2017. Mapping submerged macrophyte biomass using a combination of methods. GRIL Symposium, Mont-Orford, QC, CA

Botrel, M, MA Altabet, I Gregory-Eaves, R Maranger. February 2013. Nitrification in shallow lakes using natural stable isotope composition of nitrate. ASLO, New Orleans, LA, USA

Scientific graphic design expertise

I am interested in graphic design as a way to communicate science. To illustrate my research I create data visualization, conceptual figures, graphical abstract, or comics using either vector (scalable smooth lines) or raster images (hand drawings). Examples of my designs can be found in all my publications, and my portfolio is on my website (morganbotrel.weebly.com/visuels--visuals.html). I also created visuals for other research projects:

Figure 3 *in* St-Gelais, NF, J-F Lapierre, R Siron, R Maranger. 2020. Evaluating trophic status as a proxy of aquatic ecosystem service provisioning on the basis of guidelines. *BioScience* 70(12): 1120-1126, https://doi.org/10.1093/biosci/biaa099

Graphical abstract *in* Blackney, AJC, LD Bainard, M St-Arnaud, Hijri, M. 2022. Soil chemistry and soil history significantly structure oomycetes communities in Brassicaceae crop rotations. *BioRxiv*, https://doi.org/10.1101/2022.07.12.499733

Language and computer skills

French (native language), fluency in spoken and written English, basic Spanish, some knowledge of Chinese

Statistical and database management softwares (R, OpenRefine, postgreSQL), geographic information systems (R, ArcGIS, QGIS), graphic design softwares (Inkscape, Vectornator, Procreate), reference management software (EndNote), Microsoft office suite (and Mac equivalent)

Contact details

Contacts can be provided upon request.