



Dr. Cécilia Barouillet (Ph.D.)

**Postdoctoral researcher**

VP Communication & Publication, International Society of Limnology (SIL)

Member of the organizing board, sedaDNA scientific society

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I am paleolimnologist & limnologist. I combine monitoring data, the paleolimnological approach and molecular biology technics to reconstruct the long-term ecological trajectory and historical functioning of lake ecosystems in response to environmental change and anthropogenic stressors at the local and global scale. I am specialized in the analysis of molecular dataset, modeling of long-term time series and multivariate datasets. I am particularly interested in finding ways to integrate the long-term perspectives offered by paleolimnological data into conservation efforts and management practices.

## SKILLS

### Personal Skills

Approachable - Cooperative – Determined - Devoted - Energetic - Friendly - Honest - Enthusiastic - Motivated - Flexible - Open-minded - Responsible - Curious – Organized

### Scientific Skills

Paleolimnology, Paleo-ecology, Freshwater Biology, Molecular Ecology, Statistical analysis, Analysis of time-series, Bioinformatic

### Languages

French (*First language*) - English (*Bilingual*) - Spanish (*Beginner*)

### Certification and Training

Driver's Licence - WHMIS Training - MED3 (Marine Emergency Duties for Small Vessels) – Pleasure Craft Operator Canadian Licence

### Software Skills

R (RStudio) – Julia - Microsoft Office - Bash (Linux) – Mothur - ArcGIS - QGIS - ORIGIN - C2 –TILIA - Open Office – PRIMER – Canoco5 – Illustrator

## ACADEMIC QUALIFICATIONS & POSITIONS

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|-------------------|--|
| <b>2020-Today</b> | Postdoctoral Researcher at the Centre Alpin de Recherche sur les Réseaux Trophiques et Ecosystèmes lacustres (UMR CARTEL, Thonon-les-bains), Institut National de Recherche pour l'Agriculture, l'alimentation et l'environnement (INRAE). |
| <b>2016-2019</b>  | PhD Research at Queen's University (Enrolled directly from a M.Sc.)- <i>Kingston (ON), Canada</i><br><b>Supervisor:</b> Dr. Brian F. Cumming ( <i>Queen's University, Ontario</i> )  |
| <b>2014-2016</b>  | M.Sc. Research at Queen's University (Enrolled directly to a PhD)- <i>Kingston (ON), Canada</i>  |
| <b>2011-2014</b>  | Licence BOPE (Biologie des Organismes, des Populations et des Ecosystems) at Université Paul-Sabatier Toulouse III - <i>Toulouse, France</i>   |

## PUBLICATIONS

### Peer-reviewed publications

- 2022** Barouillet C., M-E. Monchamp, S. Bertilsson, K. Brasell, I. Domaizon, L. S Epp, A. Ibrahim, H. Mejbél, E. Canisius Nwosu, J. K. Pearman, M. Picard, G. Thomson-Laing, N. Tsugeki, J. Von Eggers, I. Gregory-Eaves, F. Pick, S. A. Wood, E. Capo. Investigating the effects of anthropogenic stressors on lake biota using sedimentary DNA. *Freshwater biology*, **00**, <https://doi.org/10.1111/fwb.14027>
- Barouillet C., V. Vasselon, F. Keck, L. Millet, D. Etienne, D. Galop, D. Rius and I. Domaizon. 2022. Paleoreconstructions of ciliate communities reveal long-term ecological changes in temperate lakes. *Scientific Reports* **12**, <https://doi.org/10.1038/s41598-022-12041-7>
- 2021** Laird, K. R., Barouillet, C., Cumming, B. F., Perrin C. J., and D. T. Selbie. 2021. Influence of glacial turbidity and climate on diatom communities in two Fjord Lakes (British Columbia, Canada). *Aquatic Sciences* **83**, <https://doi.org/10.1007/s00027-020-00767-3>
- 2019** Barouillet, C. 2019. Long-term response of sockeye salmon (*Oncorhynchus nerka*) nursery lakes to climate and watershed management activities in British Columbia (Canada). PhD, Queen's University
- Barouillet, C., B.F. Cumming, K.R. Laird, C.J. Perrin and D.T. Selbie. 2019. Influence of glacial flour on the primary and secondary production of Sockeye Salmon nursery lakes: a comparative modern and paleolimnological study. *Canadian Journal of Fisheries and Aquatic Sciences* **76**, <https://doi.org/10.1139/cjfas-2018-0372>

### In preparation

Barouillet C., Capo E., Jenny J-P., Debroas D., Sabatier P., Domaizon I.. Assessing the resilience and resistance of microeukaryote communities to eutrophication and climate change in large temperate peri-alpine lakes.

Barouillet C., Capo E., Domaizon I. Chapter 6: Protists DNA archives in lake sediments. *In Tracking Environmental Change Using Lake Sediments: Volume 6 - Sedimentary DNA. [Eds] Eric Capo, Cécilia Barouillet, John P. Smol*

Capo E., Barouillet C., Smol J.P. Chapter 1: Using sedimentary DNA to unravel past changes in biological communities Protists DNA archives in lake sediments. *In Tracking Environmental Change Using Lake Sediments: Volume 6 - Sedimentary DNA. [Eds] Eric Capo, Cécilia Barouillet, John P. Smol*

Soares LMV, Desgue-Itier O, Domaizon I, Barouillet C, Jenny J-P. Integrating lake biogeochemical models into paleolimnological approaches: Case study of perialpine lakes over the period 1850–2100

### Research Report

Perrin C. J., C. Barouillet, B. F. Cumming, D. T. Selbie, K. R. Laird, B. Stables, J. Hume, S. Harris, A. Hebert, S. Bennett. 2017. Bridge River Water Use plan – Seton Lake aquatic productivity monitoring: progress in 2016.

Perrin C. J., C. Barouillet, B. F. Cumming, D. T. Selbie, K. R. Laird, B. Stables, J. Hume, S. Harris, A. Hebert, S. Bennett. 2016. Bridge River Water Use plan – Seton Lake aquatic productivity monitoring: progress in 2015.

Perrin C. J., C. Barouillet, B. F. Cumming, D. T. Selbie, K. R. Laird, B. Stables, J. Hume, S. Harris, A. Hebert, S. Bennett. 2015. Bridge River Water Use plan – Seton Lake aquatic productivity monitoring: progress in 2014.

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## Peer-Review EXPERIENCE

Pre-publications reviews of 2 manuscripts for: (1) Journal of Paleolimnology, (1) Journal of Great Lake Research

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## RESEARCH PROJECT

- 2022-2023** Pole RD Ecla, Axe 1 Caractérisation et évaluation de l'état et des trajectoires des milieux lacustres, de leur biodiversité, et de leur fonctionnement – Mieux comprendre et caractériser le rôle des micro-prédateurs dans les réseaux trophiques lacustres – led with Dr. Isabelle Domaizon
- 2020-2022** Pole RD Ecla, Axe 2a Surveillance, impact et adaptation au changement climatique – Réponse à long-terme de la diversité des communautés lacustres : diagnose des impacts climatiques et anthropiques locaux via l'application ADN sédimentaire – led with Dr. Isabelle Domaizon

- 2016-2019** PSC Northern Fund 2016 – Babine Lake, BC, Sockeye Salmon nursery ecosystem structure, functioning and productive capacity: an integrated limnological, paleolimnological, and fisheries assessment – led with Dr. Brian F. Cumming, Dr. Kathleen R. Laird & Dr. Daniel T. Selbie
- 2014-2016** Bridge River Water Use plan – Seton Lake aquatic productivity monitoring – led with Dr. Brian F. Cumming, Dr. Kathleen R. Laird & Dr. Daniel T. Selbie

## TEACHING & MENTORSHIP

### CO-AUTHORED THESIS

The response of Cladocera assemblages and size structure to multiple stressors in three Kawartha Lakes (Ontario) over the last 200 years. Shirui Li. MSc Thesis. Defended in 2021.

### MENTORSHIP OF UNDERGRADUATE THESIS

- 2018-2019** **Haley Richardson** – What factors are causing a shift in *Daphnia* composition in the Adirondack Park (New York, USA)?
- 2017-2018** **Madeleine Stein** - Understanding changes in subfossil Cladocera in response to multiple stressors at Pigeon Lake
- 2016-2017** **Sydney Hennessy** - Assessment of regional changes in cladoceran zooplankton assemblages since pre-industrial times from reference lakes from the Experimental Lakes Area (Ontario, Canada)
- Aimee Bertin** - In search of a climate signal: changes in cladoceran assemblages since preindustrial times in minimally-impacted Adirondack references lakes
- 2015-2016** **Donna Paznar** - Changes in cladocera assemblages throughout the Holocene in Wolf Lake (Adirondacks, New York, USA)

### LECTURES

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| <b>2022</b> | M2 ECOMONT - module "Ecologie à large échelle : Retro-observation et Ecologie spatiale".                                 | Rétro-observation et approches sedDNA en paléo-limnologie  |
| <b>2022</b> | Summer School UNITA - USMB et Università di Torino, « Lakes and rivers ecological monitoring» (Thonon-les-bains, France) | Sedimentary fossils & genetic archives as a powerful tool to reconstruct long-term biological changes                                      |
| <b>2021</b> | Stage Master USMB ECOMONT (Thonon-les-bains, France)   | Paleolimnology & sedimentary DNA: Reconstruct past environmental changes.  |
| <b>2019</b> | BIOL335-Limnology and Aquatic Ecology (Queen's University, Kingston, Canada)   | The effect of the Bridge River Diversion on the pelagic production of Seton Lake, a Sockeye Salmon nursery lake (British Columbia, Canada) |
| <b>2018</b> | Geography Course (University of Ottawa, Ottawa, Canada)  | Long term environmental change in Freshwater Ecosystems  |
| <b>2018</b> | BIOL527-Community and Ecosystem Ecology (Queen's University, Kingston, Canada)   | Perspective of graduate studies from a (veteran?) graduate student & sharing about my research   |
| <b>2017</b> | BIOL303-Community and Ecosystem Ecology (Queen's University, Kingston, Canada)   | Long term environmental change in Freshwater Ecosystems  |
| <b>2016</b> | BIOL303-Community and Ecosystem Ecology (Queen's University, Kingston, Canada)   | Long term environmental change in Freshwater Ecosystems  |

### TEACHING EXPERIENCE

- 2022** **Introduction to paleolimnology & sedimentary DNA analysis** – Field work demonstration, Lab experiment & Lecture
- 2019-2020** **BIOL205 Mendelian and Molecular Genetics** – Laboratory Experiment & Working Groups
- 2018-2019** **Head Teaching Assistant BIOL335 Limnology and Aquatic Ecology** - Laboratory Experiment, Lectures, organization of field work week-end for 25 students
- 2016-2017** **BIOL422 Conservation Biology** – Working Groups
- 2016-2017** **BIOL202 Diversity of Life II** - Laboratory Experiment

<b>2016-2017</b>	<b>BIOL335 Limnology and Aquatic Ecology</b> - Laboratory Experiment
<b>2015-2016</b>	<b>BIOL201 Diversity of Life I</b> - Laboratory Experiment
<b>2015-2016</b>	<b>BIOL319 Introduction to Ethnobotany (Online Course)</b> – Working Groups
<b>2014-2015</b>	<b>BIOL103 Introductory Biology of Organisms</b> – Laboratory Experiment & Working Groups
<b>2014-2015</b>	<b>BIOL205 Mendelian and Molecular Genetics</b> – Laboratory Experiment & Working Groups

## SEMINARS & CONGRESSES

### Seminars

- 2022** Studying the long-term dynamic of freshwater ecosystems through sedimentary DNA research: a potential tool for management and conservation – Limnological Institute, Konstanz Universität, Konstanz, Germany
- 2021** Share personal experiences and advices about my first year after a PhD – Virtual Seminar, PEARL Lab, Kingston (ON), Canada
- 2020** Etude paléolimnologique de l'influence du climat et des perturbations anthropiques sur les frayères à saumon rouge en Colombie Britannique (Canada) – UMR CARTEL, Thonon-les-bains, France
- 2019** Long-term response of sockeye salmon (*Oncorhynchus nerka*) nursery lakes to climate and watershed management activities in British Columbia (Canada) – Departmental Seminar, Department of Biology, Queen's University, Kingston (ON), Canada

### Congress Presentations

#### 2022

**Barouillet C.**, Gonzalez Trujillo J.D., Geist J., Gíslason G.M., Irvine K., Boon P.J. Summary of the workshop: “*Limnology at the crossroads: its role in freshwater conservation and management?*” – *SIL (International Society of Limnology)*, Berlin, Germany

**Barouillet C.**, Nwosu E., Capo E., Epp L., Domaizon I. Studying the long-term dynamic of freshwater ecosystems through sedimentary DNA research: a potential tool for management and conservation. – *SIL (International Society of Limnology)*, Berlin, Germany

Soares, L.M.V., Desgue-Itier, O., Domaizon, I., **Barouillet, C.**, Jenny, J-P. Integration of lake modeling, paleolimnological records and in situ measurements towards the reconstruction of dissolved oxygen concentrations in peri-alpine lakes over 250 years (1850–2100). – *IAL-IPA, Argentina (International Paleolimnological Association)*

Soares, L.M.V., Desgue-Itier, O., Domaizon, I., **Barouillet, C.**, Jenny, J-P. Integrating lake modeling and paleolimnological records for long-term simulations of water quality in a deep peri-alpine lake. – *SIL (International Society of Limnology)*, Berlin, Germany

#### 2021

**Barouillet C.**, Vasselon V., François K., Millet L., Etienne D., Galop D., Rius D., and Domaizon I. Changes in ciliate communities reveal functional modification of lakes ecosystem over the last century. – *SIL (International Society of Limnology) 2021, Online, Oral Presentation*

Rotschi J., Domaizon I., Gregory-Eaves I., Lami A., **Barouillet C.**, Etienne D., Messenger, E., Jenny J-P. The paradox of increasing long-term carbon sequestration in lake ecosystems despite reoligotrophication: the case of four large French perialpine lakes– *SIL (International Society of Limnology) 2021, Online, Oral Presentation*

**Barouillet C.**, Rotschi J., Jenny J., Lami A., Etienne D., Domaizon I. Reconstructing the long-term dynamic of pigmented communities in freshwater ecosystems using qPCR. – *EGU (European Geosciences Union) 2021, Online, Oral Presentation*

Rotschi J., Domaizon I., Gregory-Eaves I., Lami A., **Barouillet C.**, Etienne D., Messenger, E., Jenny J-P. The paradox of increasing long-term carbon sequestration in lake ecosystems despite reoligotrophication: the case of four large French perialpine lakes – *EGU (European Geosciences Union) 2021, Online, Oral Presentation*

## 2019

**Barouillet C.**, Meyer-Jacob, C., Mushet, G.R., Hennessy, S., Bertin, A., Cumming, B.F. Dissolved organic Carbon concentrations exert a stronger control on the cladoceran community composition of boreal lakes than warming. – *ASLO 2019 Joint Meeting (Puerto Rico, USA), Oral Presentation*

**Barouillet C.**, Meyer-Jacob, C., Mushet, G.R., Hennessy, S., Bertin, A., Cumming, B.F. Dissolved organic Carbon concentrations exert a stronger control on the cladoceran community composition of boreal lakes than warming. Brock University – *The 11th Ontario Québec Paleolimnological Symposium (St Catherines, ON, Canada)*.

**Barouillet C.**, Bertin, A., Hennessy, S., Meyer-Jacob, C., Mushet, G.R., Cumming, B.F. Can we track the effect of warming on the cladoceran communities of minimally-impacted lakes? – *Canadian Conference for Fisheries Research / Society of Canadian Limnologists annual meeting (London, ON, Canada), Oral Presentation*

## 2018

**Barouillet C.**, D. T. Selbie, K. R. Laird, P. R. Leavitt, C. J. Perrin, and B. F. Cumming. Paleolimnological investigation of the impact of the bridge-river diversion on primary and secondary producers in Seton Lake. – *Brock University – The 11th Ontario Québec Paleolimnological Symposium (St Catherines, ON, Canada)*

## 2017

**Barouillet C.**, D. T. Selbie, K. R. Laird, P. R. Leavitt, C. J. Perrin, and B. F. Cumming. Paleolimnological investigation of the impact of the bridge-river diversion on primary and secondary producers in Seton Lake. – *Canadian Conference for Fisheries Research / Society of Canadian Limnologists annual meeting (Montréal, QC, Canada), Oral Presentation*.

## 2016

**Barouillet C.**, D. T. Selbie, K. R. Laird, P. R. Leavitt, C. J. Perrin, and B. F. Cumming. Paleolimnological investigation of the impact of the bridge-river diversion on primary and secondary producers in Seton Lake. – *Queen's University – The 9th Ontario Québec Paleolimnological Symposium (Kingston, ON, Canada), Oral Presentation*.

**Barouillet C.**, D. T. Selbie, K. R. Laird, P. R. Leavitt, C. J. Perrin, and B. F. Cumming. Paleolimnological investigation of the impact of the bridge-river diversion on primary and secondary producers in Seton Lake. – *Lillooet – Workshop for the BC Hydro and SER Bridge River Diversion Monitoring Program-6. 2016, Oral Presentation*.

**Barouillet C.**, K. R. Laird, B. F. Cumming, D. T. Selbie, P. R. Leavitt, and C. J. Perrin. Has the productivity of Seton Lake (British Columbia, Canada) changed since the development of a hydroelectric power project? – *WatIF International Graduate Conference 2016 (Kingston, ON, Canada), Oral Presentation*.

**Barouillet C.**, K. R. Laird, B. F. Cumming, D. T. Selbie, P. R. Leavitt, and C. J. Perrin. Paleolimnological investigation of the impact of the bridge-river diversion on primary and secondary producers in Seton Lake, a sockeye salmon lake in British Columbia (Canada). – *ASLO 2016 Summer Meeting (Santa Fe, USA), Oral Presentation*.

## 2015

**Barouillet C.**, K. R. Laird, B. F. Cumming, D. T. Selbie, P. R. Leavitt, and C. J. Perrin. Paleolimnological investigation of the impact of the bridge-river diversion on primary and secondary producers in Seton Lake, a sockeye salmon lake in British Columbia (Canada). – *International Paleolimnology Symposium 2015 (Lanzou, China), Oral Presentation*.

**Barouillet C.**, B. F. Cumming, D. Selbie, K. R. Laird and Peter R. Leavitt. Investigating the long-term influence of the Bridge-River Diversion on Sockeye Salmon nursery ecosystem productivity in Seton Lake, British Columbia: A comparative paleolimnological study. – *Water Symposium (Kingston, ON, Canada), Oral Presentation*.

**Barouillet C.**, B. F. Cumming, D. T. Selbie, K. R. Laird and Peter R. Leavitt. Paleolimnological Assessment of the Bridge River Diversion and Climate Change on Sockeye Salmon in Seton and Anderson lakes, British Columbia, Canada. – *Canadian Conference for Fisheries Research / Society of Canadian Limnologists annual meeting (Ottawa, ON, Canada), Poster presentation*.

## Congress Session Convener

Reconstructing eco-environmental dynamics from sediment records and ancient DNA – 2022, SIL (International Society of

Limnology) – Chairs: **Barouillet** C., Belle S.

Deciphering past aquatic ecosystem dynamics using sedimentary ancient DNA – 2022, JASM (Joint Aquatic Science Meeting) – Chairs: Spanbauer T., Monchamp, M-E., Capo E., & **Barouillet** C.

Impacts of climate change in Aquatic Ecosystems – 2019, CCFFR-SCL \_ Chairs: **Barouillet** C., & Cumming B. F.

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## VOLUNTEER EXPERIENCE

- 2021-present** Vice-President in charge of Communication & Publication for the International Society of Limnology (SIL)
- 2020-present** Member of the Organizing Board of the sedaDNA scientific society (Coordinator of e-coffee & the African sedaDNA working group)
- 2020-present** Membre du Comité d'Administration de l'Association Française de Limnology (AFL)
- 2020-2021** Co-chair of the Equity, Diversity and Inclusion Joint Committee for CCFFR (Canadian Conference for Fisheries Research) and SCL (Society for Canadian Limnologist)
- 2018-2022** Francophone Student Representative for SCL
- Summer 2017** Co-lead piston coring field work for the University of Glasgow (1 month) – Regina (SK), Canada
- 2015-2016** Program Coordinator for the Water Initiative for the Future International Graduate Student conference 2016 – *Kingston (ON), Canada*
- 2013-2014** Volunteer at PEARL - *Queen's University, Kingston (ON), Canada*
- 2013-2014** Volunteer at Plaxton Laboratory - *Queen's University, Kingston (ON), Canada*
- 2011-2013** Manager at Sentier Nature (a protected area owned by the ecologist and naturalist association, Veracruz) - *Paul Sabatier University, Toulouse, France*

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## SCIENTIFIC EVENTS, OUTREACH & WORKSHOPS

2022

Workshop – “Limnology at the crossroad: its role in freshwater conservation and management?” – Phil Boon, Cécilia **Barouillet**, Juan-David Gonzalez Trujillo, Geist Jürgen, Gisli M. Gislason, Ken Irvine.

2021

Lecture for secondary school students – Jurassique Parc sous les eaux: un voyage dans le temps avec la paléolimnologie – Cécilia **Barouillet**.

Workshop - “Indigenous Relations in Research” - Emily Stewart, Kristen Coleman, Andrea Kirkwood, Cécilia **Barouillet**. CCFFR-SCL Congress 2021 Virtual Workshop.

Symposium – 1<sup>st</sup> Symposium of the African sedaDNA working group – Cécilia **Barouillet**, Eric Capo. sedaDNA scientific society.

2020

Workshop – “Science Communication: Beyond the Manuscript” - Organizer(s): Kristen Coleman, Cécilia **Barouillet**. CCFFR-SCL Congress 2020.

2019

Panel Discussion – “Tips to get a job in Aquatic Sciences” – Organizer(s): Cécilia **Barouillet**, Kristen Coleman. CCFFR-SCL Congress 2019.

2016

Science Pub Night - How to integrate science into public policy? – Organizer(s): Cécilia **Barouillet**. Kingston (ON), Canada - Event organized for Evidence for Democracy E4D (Canada) which aims to bring together students and professors from across departments in an informal pub atmosphere to discuss current issues in science).