

1 october 2020

DESCRIPTION OF THE POSITIONS

Context

The cycling of carbon in terrestrial and aquatic environments is rapidly changing in response to changes in climate, atmospheric deposition, and human land uses. While some changes (e.g. warming, increasing CO₂, eutrophication) may lead to increasing primary production hence carbon sequestration in ecosystems, other aspects of global change (e.g. “browning” of inland waters, increases in precipitations, damming) may favor CO₂ emissions to the atmosphere. This movement of carbon among the terrestrial, aquatic and atmospheric compartments co-mobilizes nutrients and contaminants, with environmental impacts on the receiving ecosystems. Disentangling the effects of changes operating over different temporal scales is central challenge in ecosystem sciences. Natural change operating over hundreds to thousands of years related to ecosystems succession and maturation, decadal changes related to modern anthropogenic changes and short to mid term linked to land uses such as damming all affect the carbon cycle. In this context, this research projects aims to:

- 1) better quantify the historical vs modern temporal variation in carbon stocks at the landscape level,
- 2) better understand the quantitative (concentrations, fluxes) and qualitative (composition, reactivity) aspects of the carbon cycle at the land-water interface, and
- 3) better constrain the carbon-nutrients-contaminants coupling in boreal landscapes

Ultimately, the common goal of these objectives is to quantify the net effect of hydro-electric damming on the carbon cycle at the landscape level in a context of multiple rapid environmental changes.

Desired skills and experience

We are looking for enthusiastic, motivated and autonomous candidates with strong leadership and teamwork skills, ideally with experience or solid foundations in ecosystem sciences to undertake MSc, PhD or postdoc research on one or several of the research objectives described above. Candidates should have, or be willing to develop interdisciplinary skills including field work in remote areas, lab work with state of the art environmental analytical infrastructure, synthesis and analysis of large datasets, and GIS, and be motivated to interact with academic and non-academic (e.g. Hydro-Québec) collaborators.

Timing

Research projects could start as early as May 2021, and we aim to assemble a team to undertake field work campaigns as early as Spring 2021. We will process applications as soon as we receive them.

Contact

Interested candidates should contact Jean-Francois Lapierre (jean-francois.lapierre.1@umontreal.ca), Julie Talbot (j.talbot@umontreal.ca) or Olivier Blarquez (olivier.blarquez@umontreal.ca) depending on their main research interests. Please join a motivation letter describing your interest and skills and experience related to one or more of the project objectives, as well as a CV including academic grades.

About the team and research environment

Lapierre lab: <https://www.lapierrelab.com/>

Talbot lab : <https://udembiogeo.com/>

Blarquez lab: <http://www.blarquez.com/>

The « groupe de recherche interuniversitaire en limnologie » (GRIL) :

https://oraprdnt.uqtr.quebec.ca/pls/public/gscw031?owa_no_site=543&owa_no_fiche=91&owa_botti_n=

The GRIL à UdeM : <http://www.gril-umontreal.com/>

The département de sciences biologiques à UdeM : <https://bio.umontreal.ca/english/home/>

The département de géographie à UdeM : <https://geographie.umontreal.ca/english/home/>

Graduate studies at UdeM : <https://esp.umontreal.ca/english/home/>

