

## Fluvial carbon export from a boreal peatland, eastern Québec, Canada

### Scientific context and objectives of the PhD project:

Peatlands are hot spots of the carbon cycle in watersheds. Globally, it is estimated that these ecosystems store a third of the global soil organic carbon stocks. In Quebec, peatlands are important ecosystems, covering ~ 8-12 Mha of the land surface and storing approx. 8 Gt of organic carbon. This PhD project part of a collaborative research program aiming at the assessment of the total carbon budget of the Romaine watershed (Côte Nord, Québec; lat 50,52482°, long -63,20652°). Peatlands greatly influence downstream surface water chemistry, since their waters are characterized by high DOC concentration and supersaturation in CO<sub>2</sub> and CH<sub>4</sub>. Stream carbon export is a significant component of peatland carbon budgets, and can represent a large proportion of the net carbon accumulation in boreal peatlands. The proposed PhD project aims at documenting (quantification, characterization, origin) the stream carbon export from one instrumented peatland selected for its representativeness in the watershed.

The PhD candidate will deploy *in situ* instrumentation to acquire a high temporal resolution of optical proxies for DOC and POC as well as dissolved CO<sub>2</sub> and CH<sub>4</sub> concentrations. These acquisitions will be combined with meteorological and hydrological acquisition to quantify fluvial carbon exports from the peatland, and identify hydrological controls of stream carbon exports. During field campaigns, dissolved organic matter (DOM) from different pools will be characterized using optical, molecular and isotopic tools to determine DOM origin and transformation from the peatland to the main stream (Romaine River). The project will require closed collaboration with other fields of carbon quantification and more specifically with the atmospheric GHG exchanges component in order to quantify the total peatland carbon budget.

**Keywords:** Peatland, Carbon, *In situ* sensing, biogeochemistry, hydrology.

**Prerequisites:** Candidates with experience in biogeochemistry, carbon cycling and hydrology are welcome to apply. They must demonstrate their abilities to work in collaboration and in remote areas during regular field campaigns.

**Location:** The PhD will take place at UQAM (Université du Québec à Montréal, Québec, Canada), with a joint PhD agreement with INPT (Institut National Polytechnique de Toulouse).

**Supervision:** Michelle Garneau ([garneau.michelle@uqam.ca](mailto:garneau.michelle@uqam.ca)), Laure Gandois ([laure.gandois@ensat.fr](mailto:laure.gandois@ensat.fr)) and André St-Hilaire ([Andre.St-Hilaire@ete.inrs.ca](mailto:Andre.St-Hilaire@ete.inrs.ca)).

**PhD Grant:** The PhD grant is 20 000\$ CAN/yr for 3 years. All field expenses and laboratory analyses will be covered.

**Starting date:** The call will remain open until filled. The PhD program starts in May 2018.

**Application:** Applications should be send directly by e-mail and should include a CV and motivation letter along with the name of two references.