



POSITION: MASTER OF SCIENCE IN FOREST ECOPHYSIOLOGY

Intra-annual growth responses of trees to environmental variability

We are looking for a student for a master's project on the boreal forest. Climate is changing inducing potential negative growth responses for boreal tree species with serious consequences for the forest industry sector and the forest carbon sequestration. These negative growth responses are often linked to short-term climatic episodes (daily to monthly), including drought events, late or early frosts. However, classical studies in forest ecology are limited to an annual time resolution, such as that of tree-rings. Intra-annual studies are scarcer and need robust monitoring data collected in the field at high temporal resolution. Such data are needed to improve the predictability of the impact of climate change on forest growth scenarios.

Objectives and methodology: The main objective of the project is to understand the vulnerability to climate and environmental changes of boreal tree species. We will monitor hourly tree stem diameter fluctuations of selected boreal trees (dendrometers installed on jack pine, black spruce and trembling aspen trees) establishing two new forest experimental sites on eskers ridges in the Abitibi region. Eskers are hilly fluvio-glacial formations made of sand and gravel. They contrast with the typical clay deposits of the Abitibi region in terms of drainage, flora, and wildlife. A transect of increasing hydric stress will be studied with three monitoring plots per site from the base (humid) to the top (xeric) of the eskers. We will use the dendrometer data and ecophysiological measurements to analyze tree growth variability according to meteorological and edaphic conditions.

Keywords: Climate change; intra-annual growth monitoring; forest vulnerability and thresholds; dendrometers; jack pine; black spruce; trembling aspen.

Hosting laboratory: The student will be based at the Forest Research Institute (Institut de recherche sur les forêts; IRF; <https://www.ugat.ca/programmes/irf/>) at the Amos campus, under the supervision of Fabio Gennaretti (<http://bit.ly/2TTGTLB>) and the co-supervision of Miguel Montoro Girona (<http://bit.ly/2N6d9ud>; UQAT) and Christoforos Pappas (<https://bit.ly/2Zm7UZP>; TELUQ). The Forest Research Institute is a dynamic, multicultural, and international institute, which provides a quality environment for students to develop research. The institute includes 13 professors and more than 60 graduate students working on a wide range of topics such as modelling, silviculture, genetics, biodiversity, ecophysiology, remote sensing, and sustainable forest management. The student will be a member of the Centre for Forest Research (Centre d'étude de la forêt; CEF; www.cef-cfr.ca), and of the Abitibi Regional County Municipality ecology research group (GREMA). Amos is an expanding campus with state-of-the-art infrastructures and a dynamic student life (<https://destinationamos.com/page/1191356>). The student will collaborate actively with our partners of the Abitibi Regional County Municipality.

Position requirements: Bachelor's degree in ecology, biology, forestry, or a related discipline with an interest in ecology and climate change. The student must be able to work with autonomy, curiosity, rigour and motivation within a multidisciplinary team. He/she should be willing to carry out fieldwork in remote locations,

have good team spirit, and excellent writing skills. A driving license and aptitudes in statistical analyses and scientific communication are an asset.

Supervisors: Fabio Gennaretti (UQAT), Miguel Montoro Girona (UQAT) and Christoforos Pappas (TELUQ).

Project collaborators: Vincent Bossé (MRC Abitibi), Annie Desrochers (UQAT), Sergio Rossi (UQAC), Loic D'Orangeville (UNB), Yves Bergeron (UQAT).

Study program: Master of ecology, University of Quebec in Abitibi-Témiscamingue (Université du Québec en Abitibi-Témiscamingue; UQAT; <https://www.uqat.ca/etudes/irf/maitrise-en-ecologie/>).

Registration date: Summer 2021.

Financial support: Scholarship of 17,500 \$/year over two years.

Information: Send your application in a single pdf containing a curriculum vitae, a cover letter, academic transcripts, and contact details for three references to Fabio Gennaretti (fabio.gennaretti@uqat.ca) and Miguel Montoro Girona (miguel.montoro@uqat.ca). We will continue to review applications until the position is filled.

Interesting web-links:

- City of Amos: <https://amos.quebec/>
- MRC Abitibi: <https://mrcabitibi.qc.ca/>
- Aigebelle national park: <https://www.sepaq.com/pq/aig/>
- Tourism in Abitibi-Témiscamingue: <https://www.abitibi-temiscamingue-tourism.org/>



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