

## Master's and PhD positions in quantitative forest insect ecology

**Location:** Toronto (UofT) and Montreal (McGill and UQAM)

**Start Date:** January 2021

**Application deadline:** August 31, or until suitable candidates are found

We are searching for quantitatively-oriented, enthusiastic, and creative students to tackle problems related to the spatial ecology of forest insect outbreaks. Selected students will have the opportunity to work with a diverse and collaborative research team examining the spatial and temporal dynamics of spruce budworm outbreaks in eastern Canada. Team members include Patrick James (U. Toronto), Dan Kneeshaw (UQAM), Brian Leung (McGill), Elise Filotas (TELUQ), Mathieu Bouchard (MFFPQ), Deepa Pureswaran (NRCAN-CFS), and Rob Johns (NRCAN-CFS).

The focal subject of this work is the outbreak dynamics of the spruce budworm (*Choristoneura fumiferana*), a native defoliator that affect millions of hectares of coniferous forest during outbreaks. Despite nearly a century of research, there remain many outstanding mysteries associated with budworm outbreaks and their effects on forests. Developing greater understanding of these underlying population dynamics is essential to improve forecasting and for developing proactive sustainable forest management strategies.

Two projects are available. The general questions associated with these projects are: 1) what determines where, when, and the rate at which populations of spruce budworm increase? 2) How will future climate and forest management regimes affect future outbreak risk and severity?

Both projects will involve leveraging large spatial-temporal databases on forest insect outbreaks to develop predictive statistical, machine learning, and spatially explicit simulation models of outbreak dynamics.

Potential students should have a strong interest in developing skills and expertise in forestry, ecology, scientific computing (e.g., R), GIS, statistics, and modelling. Pre-existing expertise in these areas would be an asset

To apply, please send a short letter of motivation, a current CV, recent transcripts, and the names of two references as a single PDF to Dr. Patrick James at [patrick.james@utoronto.ca](mailto:patrick.james@utoronto.ca)

We encourage all qualified students to apply. Final selection will however give preference to Canadian citizens and permanent residents given current COVID-19 related uncertainty around international travel.