



Facultés des Sciences et de Génie  
Département de Biologie

## Masters project description

Modeling the critical preyscape of the North Atlantic Right Whales.

### Who?

We seek a recent graduate in a first cycle in biology/ecology or computer science program.

Some **background in biological and/or biogeochemical modelling** is preferred, although anyone with good quantitative skills is encouraged to apply.

**Knowledge of programming environments** such as R, Python or MATLAB is an advantage.

We are committed to fostering equity, diversity, and inclusion in our research teams, and we strongly encourage candidates from groups underrepresented in STEM to apply. Specific mentoring and support structures are in place to help all our students succeed.

### What?

Changes in the hydrological and temperature regimes over the Northwest Atlantic shelf area have been faster and much larger than almost anywhere else on the world's Ocean. It led to a shift towards a new oceanographic state with important impacts on the critically endangered **North Atlantic Right Whales**. In the 2010s, right whales have shifted their summer-fall foraging habitat from the New England and Canadian Atlantic waters to explore new habitats further north, in particular within the Gulf of St. Lawrence, leading to a significant increase in mortality events.

In response, the Canadian federal government has considerably increased research about the ecology of right whale and local communities activities in Canadian waters through its agencies such as Fisheries and Oceans Canada and the Canadian Space Agency.

As a result, this **M.Sc. project is part of the larger "Système Intégré de Modélisation de la Baleine noire de l'Atlantique" research project**. Our international consortium composed of partners from Canada, the United States and France will develop models based on high-resolution operational circulation models and satellite-derived bio- optical variables using right whale preferred prey (*Calanus* sp.) as a sentinel species. Our novel tools will help decision-makers and mariners make more accurate recommendations when determining restriction zones for anthropogenic activities in areas likely to encounter right whale.

**The specific objective of this M.Sc. project** is to model the spatio-temporal distribution of *Calanus* individuals. The candidate will work first on the vertical distribution of these organisms, then on their horizontal distribution in response to environmental drivers. This output will be an important component of the overarching right whale distribution modelling approach.

An internship with our partners in the US is part of the project.

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### Where?

The successful candidate will be enrolled in the Biology Masters from the **Biology Department from Université Laval** ([www.bio.ulaval.ca](http://www.bio.ulaval.ca)) in **Québec City**, under Prof. Frédéric Maps supervision.

The teaching and [living environment is essentially francophone](#). Work in the laboratory and interactions with colleagues usually occur in English.

### When?

Start date could be as soon as **September of 2021** (fall semester).

It could start remotely, but it is expected to become “on site” in Québec City by the end of 2021 at the latest, providing the public health requirements allow it.

### How much?

The MSc grant is **17,500 CAD/y** for **2 years**.

### How?

Send your application to Prof. Frédéric Maps ([frederic.maps@bio.ulaval.ca](mailto:frederic.maps@bio.ulaval.ca)) including:

1. A **letter of motivation (1 page)** and a **CV** (up to date).
2. The final transcript of the last degree obtained (or a document attesting the thesis has been submitted).
3. Two contact persons for reference.

If you are selected for an interview, you will be contacted rapidly, and you should expect to be asked to do some “homework” related to the position.

We are very eager to hear from you!

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