



PhD in Natural Sciences

The role of shipping disturbance on the spatial ecology of cetaceans in the St. Lawrence

Context

Several species of cetacean frequent the St. Lawrence Estuary and the Saguenay Fjord. The St. Lawrence Estuary beluga population is endangered under Canada's Species at Risk Act. One of the three main threats to its recovery is underwater noise from shipping, the impacts of which include disturbance, masking of communications and reduced use of certain habitats. Several species of large baleen whales also actively use this area, including the blue whale, fin whale, humpback whale and minke whale.

While the impacts of underwater noise have been described for several cetacean populations exposed to chronic interactions with human activities around the world, their characterization for the St. Lawrence cetaceans is very limited.

The project

Initially, the student will describe the role played by shipping activities on the spatial ecology of St. Lawrence belugas and large baleen whales in various ecologically sensitive sectors of their summer habitat, based on spatial data from maritime traffic (AIS) and cetacean observations (land-based observations, aerial surveys, telemetric data and acoustic detections). The potential effects of traffic that will be explored include the redistribution of animals, the temporary abandonment of habitats and changes in cetacean aggregations.

Secondly, the student will explore the ecological mechanisms underlying the observed decline in the use of certain sensitive habitats by cetaceans in the increased presence of traffic. This part of the project will include the implementation of a specific protocol leading to the collection of in situ data.

The results of the project will be used to refine the cetacean movement models in the 3MTSim simulator, which models the spatial interactions between traffic and cetaceans in the St. Lawrence Estuary and Saguenay Fjord. The results will also make it possible to recommend realistic conservation measures aimed at reducing the impact of underwater shipping noise on belugas and baleen whales, thereby working towards the recovery of populations of cetaceans with at-risk status.



The student will work in the highly collaborative and inclusive work environment of the Laboratoire interdisciplinaire de simulation socio-écologique (LISSÉ) at UQO alongside several research professionals and students. He/she will also interact with external partners from the federal (Fisheries and Oceans Canada, Parks Canada) and provincial (MELCCFP) governments, as well as experts from environmental NGOs (GREMM) with expertise in the project's related fields.

Skills required

The student should have an excellent background in spatial analysis of ecological data, including spatial statistics and spatial-temporal analysis in R. He/she should demonstrate the ability to propose and implement cetacean data acquisition protocols. He/she must be comfortable working as part of a team in an interdisciplinary research context, be able to carry out literature reviews on technical subjects in English and be able to communicate scientifically (orally and in writing) in English. Experience with individual-based modelling (IBM) and hydroacoustic data is an asset. The person must also be available to collect data in the field during the summer.

Initiative, listening skills, intrinsic motivation, and autonomy are key qualities for successfully completing this project.

Practical details

Location: [Laboratoire interdisciplinaire de simulation socio-écologique \(LISSÉ\)](#), Université du Québec en Outaouais (UQO) in Gatineau (Hull sector) or Ripon, Quebec, Canada. Regular field trips (St. Lawrence Estuary and Saguenay Fjord).

Project start date: as soon as possible (autumn 2025 at the earliest)

Remuneration: 3-year fellowship @ \$27,000/year. Numerous opportunities for additional scholarships.

Application: Send copies of transcripts of all graduate studies, cover letter and CV to clement.chion@uqo.ca and angelique.dupuch@uqo.ca

Application deadline: 30 June 2025 or until the position is filled.