Project title: Larval and juvenile ecology of Atlantic halibut in the St. Lawrence Estuary and Gulf



The main objective of this project is to reveal the distribution and ecology of the larval and juvenile stages of Atlantic halibut in the St Lawrence Estuary and Gulf (SLEG). To date, the first two years of life remain a veritable black box, which severely limits our understanding of the environmental factors controlling recruitment in this stock. Indeed, for most marine fish, it is during the succession of early developmental stages in the first year of life that >99% of mortality occurs. Consequently, variability in environmental conditions that may lead to small variations in the survival rates of larvae and juveniles can have a major impact on the number of individuals that will reach adulthood and thus be available for commercial fishing. A detailed understanding of the habitats successively occupied during the first year of life is essential in the context of implementing an ecosystem-based approach to resource management.

Although the distribution of the early-life stages of halibut remains largely unknown; we can draw on recent studies to guide the sampling plan. Satellite tagging of adults throughout the SLEG has revealed that the deep waters of the Laurentian Channel constitute a major spawning ground towards which the majority of adults converge to spawn from January to March. Opportunistic zooplankton sampling carried out in winter aboard the research icebreaker NGCC Amundsen has also confirmed the presence of larvae near the spawning grounds. As for juveniles, anecdotal observations from opportunistic surveys using beam trawls at depths of 5-15 m suggest a strong presence in the coastal areas of the North Shore of the Gulf of St Lawrence. Based on this fragmentary knowledge, the specific objectives of the proposed thesis are:

1- To define the distribution and dispersal of larvae, and to assess their feeding preferences and growth trajectory. This objective will be based on a winter survey of halibut larvae in the Laurentian Channel, as well as a detailed analysis of the diet and otolith microstructure of-captured individuals.

2- To characterise the diet of juveniles in coastal nursery areas and assess selective survival based on growth. As part of this objective, an analysis of the stomach contents of juveniles caught using a beam trawl will be carried out, and the microstructure of the otolith will also be studied to identify potential differences in the growth trajectory of the larvae, indicating selective mortality based on growth.

3- To deepen our understanding of the origin and connectivity of halibut in the SLEG. This objective aims to determine the elemental signature corresponding to the origin of each individual. This mapping of elemental signatures will enable us to infer the origin of adults sampled during previous studies.

The successful candidate will work under the supervision of professors Dominique Robert (ISMER-UQAR), Pascal Sirois (UQAC) and Jonathan Fisher (Marine Institute – Memorial University of Newfoundland).

Required profile:

- Hold an MSc degree in biology, ecology, environmental studies or a related discipline relevant to the proposed research;
- A keen interest and physical capacity to carry out fieldwork on board vessels of various sizes;
- Demonstrate independence and scientific rigour, and have an interest in the sustainable management of fishery resources.

To apply, candidates must first send the following documents to Dominique Robert (dominique_robert@uqar.ca) by 20 January 2027; all are required for the application to be considered:

- A cover letter (maximum 2 pages) explicitly detailing how the student believes they can contribute to the research project, based on their academic background and personal interests.
- A CV detailing the student's academic background, projects in which they have participated, and any other relevant professional and life experiences;
- All university transcripts;
- Three letters of recommendation, at least one of which must be from a previous research supervisor.

Equity, diversity and inclusion: We encourage applications from people from diverse backgrounds and are committed to providing an inclusive and respectful research environment. Selection will be based on skills, research potential and motivation.