
Fully funded MSc Research Opportunities

“Monitoring Newfoundland & Labrador’s marine conservation areas”

Opportunities: Up to *three fully funded MSc positions* are available within the Fisheries and Marine Institute of Memorial University of Newfoundland (www.mi.mun.ca). Memorial University of Newfoundland is a hub of ocean sciences located in the province’s capital. St. John’s is a safe and friendly city with great historical charm, known for its hospitality, live music, a vibrant cultural life, and easy access to wilderness and a wide range of outdoor activities. The Fisheries and Marine Institute is Canada’s most comprehensive centre for education, training, applied research, and industrial support for the ocean industries.

These positions will provide opportunities for students to contribute to the conservation of Canada’s marine life within a collaborative research and training environment including research scientists, research chairs, and technical experts from the Fisheries and Marine Institute’s Centre for Fisheries Ecosystem Research (CFER, www.mi.mun.ca/cfer), the Centre for Applied Ocean Technology (CTec, <https://www.mi.mun.ca/departments/centreforappliedoceantechnology/>), and Fisheries and Oceans Canada’s Ecological Sciences Section (St. John’s). These positions will be co-supervised by researchers from these groups, while also including annual at-sea research opportunities and access to leading research facilities and technology training within both government and academic laboratories.

Support includes a \$24,000 CAD annual stipend for two years.

Background and Research Themes: Regionally, nationally and internationally, marine conservation areas (MCAs) and marine protected areas (MPAs) continue to be designated, with further requirements to monitor and assess their status and dynamics. However, in some regions these areas are exceptionally large, distant from shore, and include deep waters; many were also designated specifically to conserve fragile benthic components such as deep sea corals and sponges. These characteristics describe many of the MCAs/MPAs in the Newfoundland and Labrador region, requiring the development, testing and integration of minimally invasive research approaches and methodologies in order to refine monitoring techniques and provide new inputs to characterize and assess conservation areas.

To achieve that objective, collaborators from the Fisheries and Marine Institute and Fisheries and Oceans Canada are combining research, training and technological capacities to advance methods of monitoring marine conservation areas in Newfoundland and Labrador waters to provide a strong scientific basis with which to evaluate their efficacy in this region and beyond. Within that objective, MSc projects are being co-developed within three linked research and training themes that also highlight some of the at-sea methodologies used:

1. **Advancing methodologies** – There are multiple minimally invasive techniques to evaluate components of marine ecosystems (e.g. still and video imagery, fisheries acoustics, multibeam mapping, remotely operated vehicles, tagging, eDNA, etc.). However the development and

testing/validation of methods is required to inform future best practices and applications. The development of automated methods to analyze large spatial datasets is another means to innovate and accelerate acoustic, optical, and/or genetic analyses.

2. **Applying methodologies** – Applying established and emerging techniques to evaluate marine populations to ecosystems involves analyses of spatial data sets and may be aided by methodological inter-comparisons. Research questions developed under this theme will combine multiple data sets, including data collected in 2022. These data will provide some of the first characterizations of populations, communities, and ecosystems within individual MCA/MPAs.
3. **Assessing MCA/MPA status** – In addition to characterizing individual areas, there are opportunities to integrate data at larger spatial scales to address potential issues of regional connectivity and/or ecosystem similarities, along with the development of multivariate MCA/MPA indicators of status. Comparing those within and among areas (and with non-protected areas) will reveal similarities and differences within the region and inform monitoring practices for future at-sea research missions.

Application: Applicants are asked to describe how their research interests, past training, and academic credentials align with the themes described above and should be familiar with the requirements of the Marine Institute's MSc degree program in Applied Ocean Technology and/or the MSc degree programs in Fisheries Science. The requirements of those programs are described via: <https://www.mi.mun.ca/programsandcourses/programs/>. In addition to a cover letter, applicants should also submit a curriculum vitae and university transcripts (official or unofficial) by email to CFER Project Manager Tasha Harrold (Tasha.Harrold@mi.mun.ca). Successful applicants could be accepted as early as January 2023.