

Acadia University: M.Sc. Student Fisheries Biology

Fully funded: \$16,500 per year for 2 years

In affiliation with the Atlantic Halibut Council and Department of Fisheries and Oceans Canada, the student will undertake their studies at Acadia University in either the Biology or Mathematics & Statistics department.

With Dr. Trevor Avery, Associate Professor, Departments of Biology and Mathematics & Statistics, trevor.avery@acadiau.ca

The student will be part of a dynamic research lab that studies various animal species (mostly fishes) in the areas of population demographics and dynamics. An example of the types of research done are found at www.strippedbass.ca and <https://www.facebook.com/strippedbassresearchteam>.

Research Objectives

To develop an estimate of the tag reporting rate for the Halibut All Sizes Tagging (HAST) program and determine how this rate may have historically varied spatially or temporally.

Project Background and Scope

The current assessment of the commercial halibut fishery in Atlantic Canada is informed in part through a capture-mark-recapture (CMR) model based on Hoenig et al. (1998a). The retention-survival rate ϕ , and the tag reporting rate, λ are important parameters of the model. While the tag retention rate can be determined empirically (i.e. through double tagging) a reliable estimate of the reporting rate is more difficult to obtain.

The Atlantic Halibut Council has been tagging Scotian Shelf-Southern Grand Banks Atlantic halibut during the annual longline halibut survey since 2006. About 8,000 fish have been tagged with about 10% (~800) of the released tags recovered and reported. Tags are generally reported by commercial fishers and by commercial fisheries observers although some have been reported by plant workers, fish mongers, and restaurant staff. However, the rate at which recovered tags are subsequently reported to DFO is unknown.

Research Activities

Using historical tagging data, reporting and associated records provided by the Atlantic Halibut Council and DFO, and using Citizen Science/Questionnaires ('surveys'). The MSc student will:

- 1) Estimate the tag reporting rate as it varies both temporally and spatially and the associated variance insofar as the data allow. This will include an examination of how the range of potential reporting rates may affect the model capture-mark-recapture model output (e.g. a sensitivity analysis).
- 2) Develop an estimate of (non-)reporting rates of recovered tags from directed surveys to characterize the tag reporting rate and sensitivity analysis. Surveys will also summarize the state of engagement, knowledge and interest of the fishing community in the tagging program. Data will come from surveys and include recommendations to improve engagement in the tagging program.

Assets

Organization of data, data wrangling, and use of R and RStudio.
Courses in statistical analysis at a 3rd or 4th -year level.
Experience with statistical models (GLM, GAM, etc.) and/or Bayesian methods.
High performance computing (HPC) knowledge or use.
Administering interviews to complete questionnaires.
Engagement with commercial fishers.

Please send via email to Dr. Avery: your CV, a statement of research and modeling experience/career objectives, and any other materials that will aid in the selection process.