MEMORIAL UNIVERSITY

Department of Biology

MSc Thesis Seminar

Mr. Jacob T. Prosser

Biology Department
Memorial University

"Effects of Stochastic Environmental Variation on the Population Dynamics of Salmon Lice (Lepeophtheirus salmonis) in Newfoundland and Labrador"

Supervisor: Dr. Amy Hurford

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Virtual Meeting

Abstract

Salmon lice *Lepeophtheirus salmonis* are a marine parasite causing a significant economic burden in salmonid aquaculture. They experience both temperature-dependent growth and salinity-dependent mortality, impacting population dynamics. Many models have explored the effect of static or seasonal environmental conditions on salmon lice population dynamics, yet none have explored the impact of short-term daily environmental fluctuations. I derived a stochastic population model with daily variability in temperature and salinity, where these fluctuations effect population dynamics through temperature-dependent maturation and salinity-dependent mortality changes. I found that increasing variability in salinity slows population growth rates and decreases the logarithmic abundance of adult females, while increasing daily variability in temperature is a poor indicator of population dynamics, which is better predicted by seasonal temperature trends. Under all stochastic environmental scenarios salmon lice populations persisted and grew in Newfoundland, Canada. Population models are a valuable tool in the management of salmon lice and allow for more sustainable aquaculture practices.