

## **The effect of the common periwinkle, *Littorina littorea*, on the biofouling and growth rate of the Eastern oyster, *Crassostrea virginica*, in aquaculture**

Bivalve aquaculture is an emerging marine industry within the United States. However, aquaculture profitability is hindered by biofouling, and current biofouling control methods are far from optimal. This study tested the applicability of using biological controls for biofouling, specifically the common periwinkle snail, *Littorina littorea*, and its ability to reduce biofouling and increase oyster growth rate of farmed Eastern oysters, *Crassostrea virginica*. Sampling took place at 4-week intervals between June 2017 and September 2017 at an oyster farm in Penobscot, ME. Three different snail density treatments of 0-, 100- and 200-snails per oyster bag were used across 30 oyster bags (10 replicates per treatment). Biofouling on oysters was assessed using a Braun-Blanquet abundance scale. Oyster weight, volume and length were measured over the study period to assess oyster growth. Results demonstrated that periwinkle snails significantly reduced biofouling on oysters but had no effect on oyster growth rates. A relatively high snail mortality suggests that the snails were possibly limited in their ability to perform optimally due to either the location of the study site or high competition among snails. Multiple considerations, such as the location of the aquaculture site, water quality and biofouling species, should be made prior to applying periwinkle snails as biological controls in bivalve aquaculture. Further research should assess the cost-effectiveness of time spent collecting periwinkles versus cleaning more biofouling if periwinkles are to be considered an economical option for biofouling control.

Advisor: Sarah O'Malley