

HOW DO ENVIRONMENTAL RISKS AFFECT THE PROFITABILITY OF THE AQUACULTURE INDUSTRY IN FLORIDA?

Edgar Marcillo

University of Florida, Gainesville, FL, USA

Hard clam aquaculture substantially contributes to U.S. shellfish production, accounting for 30.1% of total production and generating \$136 million in revenue in 2018 (Perdue & Hamer, 2019). Hard clam production in Florida is concentrated in the Gulf of Mexico, where the state has designated over 300 hectares of coastal mudflat for commercial aquaculture leasing (Black Jr, 2021). However, clam aquaculture faces strong environmental challenges. We use a stochastic bioeconomic model to calculate the profitability of Florida's Gulf Coast clam aquaculture sector. The model considers the most significant environmental threats that local producers face, including high temperature, low salinity, and harmful algal bloom (HAB) events. High temperature and low salinity events restrict clam development and increase mortality, reducing profitability. During HAB events, the algae produce toxins that can accumulate in clam tissues, making them unsuitable for human consumption. Consequently, state authorities close harvesting areas, preventing any harvest by local growers until water quality has returned to safe levels. This delay in harvesting allows for continued mortality of clams to occur and potentially allows the clams to grow beyond the marketable size, both of which impact profits. These risks vary by county. Low salinity primarily affects northern counties, particularly Franklin, reducing the net present value by 81.6% for Franklin County compared to the scenario without any risk. Conversely, high temperature and HABs significantly impact southern counties, especially Lee, resulting in an 83.2% reduction in net present value for Lee County. When evaluating the economic implications for each county, Levy and Franklin stand out as the most affected. These two counties produce approximately 90% of clam production along the west coast of Florida. Climate change and land use change are expected to worsen the risks faced by the Florida aquaculture industry, further impacting the water quality and profitability of the industry.

PRESENTER BIO: Postdoctoral Research Associate in the Food and Resource Economics Department at the University of Florida, Ph.D. in Food and Resource Economics from the University of Florida, M.Sc. in Applied Economics, and B.Sc. in economics from the Universidad del Valle in Colombia.