

**Proposal #:** 20SER016-002

**Project Title:** Creating resilient oysters (*Crassostrea virginica*) to enhance aquaculture and restoration

**Applicant:** Marine Environmental Sciences Consortium

**Priority Addressed** Priority #2 – Science or Technology that Promotes Sustainable U.S. Seafood Production and Harvesting

**Principal Investigators:** Dr. Lee Smee, lsme@disl.org; Dr. Ben Belgrad, bbegrad@disl.org; Dr. William 'Bill' Walton, bwalton@disl.org

**Abstract:** Oyster (*Crassostrea virginica*) harvesting is a key feature of the economy and culture of Gulf Coast states. Unfortunately oyster populations have declined precipitously, and harvesting is 1/8 of historic levels in Mississippi and remains closed in Alabama due to low natural abundance. To restore oyster populations and boost production levels, state fisheries resource agencies in Mississippi and Alabama initiated a fisheries enhancement effort to rebuild oyster populations and increase on-bottom aquaculture by remote setting where hatchery reared oyster larvae are settled onto hard substrate (e.g. shell) and then placed in an estuary to form a new reef or enhance an existing reef base. We will investigate a new hatchery technique to increase oyster resilience, aquaculture yields, and improve remote setting restoration by stimulating oysters to grow thicker shells, thereby reducing their predation risk and susceptibility to stressful abiotic conditions. Our previous research revealed early exposure to predator cues caused oysters to produce thicker, stronger shells, which increased their survival. We hypothesize that exposure to predator cues within the hatchery will speed oyster growth, cause them to grow stronger shells that have higher survival during transport and maturation in the field, and be more resistant to predation and stressful abiotic conditions.

**Summary of potential commercial benefits to the fishing community of the research results:** Traditional off-bottom aquaculture cannot satisfy the tremendous demand for oysters. We propose to develop a new inexpensive technique to improve the return on investments states are making towards on-bottom aquaculture. By stimulating oysters to grow stronger shells, we will reduce their predation risk and susceptibility to adverse conditions in the field as well as increase their marketability as thicker shelled oysters are easier to transport and shuck. Increasing the number of oysters which survive to maturity will not only help revitalize this decimated fishery, but also speed reef recovery efforts, providing essential habitat to other commonly fished species.

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