

THAD COCHRAN MARINE AQUACULTURE CENTER

The Thad Cochran Marine Aquaculture Center (TCMAC) in Ocean Springs, Miss., is part of USM's School of Ocean Science and Engineering. Our facility at GCRL's Cedar Point site works with industry, government and non-profit organizations to alleviate the bottlenecks that constrain the production of marine species and promote sustainable marine aquaculture.

RESEARCH AND DEVELOPMENT

Aquatic Health

Center scientists investigate topics in marine animal health ranging from diagnostics and taxonomy of marine pathogens to ecology and epidemiology of infectious diseases in the marine environment. Center scientists use laboratory, molecular and mathematical approaches to explore the mechanisms of disease outbreaks and control strategies in molluscs, crustaceans and finfish.

Genetics

Research in genetics supports the development of breeding programs to improve production traits. Center scientists employ high throughput sequencing technologies to perform high-density scans of the genome and transcriptome of target species to characterize the genetic basis of characters and design effective selective breeding strategies. Genomic studies also aim to assist with the management of genetic impacts of aquaculture through monitoring genetic diversity and population structure in wild stocks.

Larviculture

Research in larviculture aims to understand the environmental and nutritional requirements of early life stages of cultured marine finfish, crustaceans and molluscs. Through manipulation of several variables, including light source characteristics, salinity, temperature, food source, nutrient content or feeding protocols, this research seeks to optimize procedures for large-scale production of marine larvae in controlled recirculating systems.

Reproductive Physiology

The reproductive physiology program focuses on developing captive spawning protocols for year-round production of high-quality seeds for aquaculture. Spawning methods are optimized through experimental manipulation of environmental variables

and/or application of hormonal therapies. Gamete preservation and in vitro fertilization following strip-spawning are also investigated to enable production of complex mating designs during breeding programs.

Live Feeds

TCMAC scientists seek to maximize production and nutritional value of algae, rotifers, *Artemia* and copepods. For copepods, the Center uses laboratory and mathematical approaches to commercial culture of *Acartia tonsa* and *Parvocalanus crassirostris*.

Recirculating Aquaculture Systems

The Center focuses on biosecure containment systems that recover and reuse waste saltwater, particularly artificial saltwater. Center scientists use biofloc and clear water systems incorporating bead filtration to maximize the efficiency of mechanical and biofiltration in the culture of a variety of marine organisms. Scientists also investigate treatment of wastewater for discharge through an aquaponics loop.

Nearshore and Offshore Aquaculture

The Center seeks to address the environmental, regulatory, structural and logistical aspects of offshore aquaculture to facilitate environmentally and economically sustainable development.

Facilities

- 100,000 ft² in 13 buildings
- 50,000 ft² culture space including live feeds
- 10,000 ft² isolated singlepass climate space for small-, medium- and large-scale replicated experiments

EOE/F/M/VETS/DISABILITY