

THE UNIVERSITY OF SOUTHERN MISSISSIPPI

THAD COCHRAN MARINE AQUACULTURE CENTER

AT THE GULF COAST RESEARCH LABORATORY





The **Thad Cochran Marine Aquaculture Center (TCMAC)** in Ocean Springs, Miss., is located at the Gulf Coast Research Laboratory (GCRL) Cedar Point site. TCMAC works with industry, government and non-profit organizations to alleviate the bottlenecks that constrain the production of marine species and promote sustainable marine aquaculture.

FACILITIES

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



RESEARCH AND DEVELOPMENT

Aquatic Health

TCMAC 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. Our 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 optimize 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. TCMAC 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.



Technology, Adaptability and Partnerships

The Thad Cochran Marine Aquaculture Center leads the way in securing and expanding gulf seafood production through the development and utilization of cutting-edge technology. TCMAC's partnerships with industry leaders are beneficial to study and perpetuate the ever-changing needs of gulf life.



The Division of Coastal Sciences in The University of Southern Mississippi's School of Ocean Science and Engineering offers both the Master of Science and Doctor of Philosophy degrees with emphasis in aquaculture.

FOR MORE INFORMATION, CONTACT
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