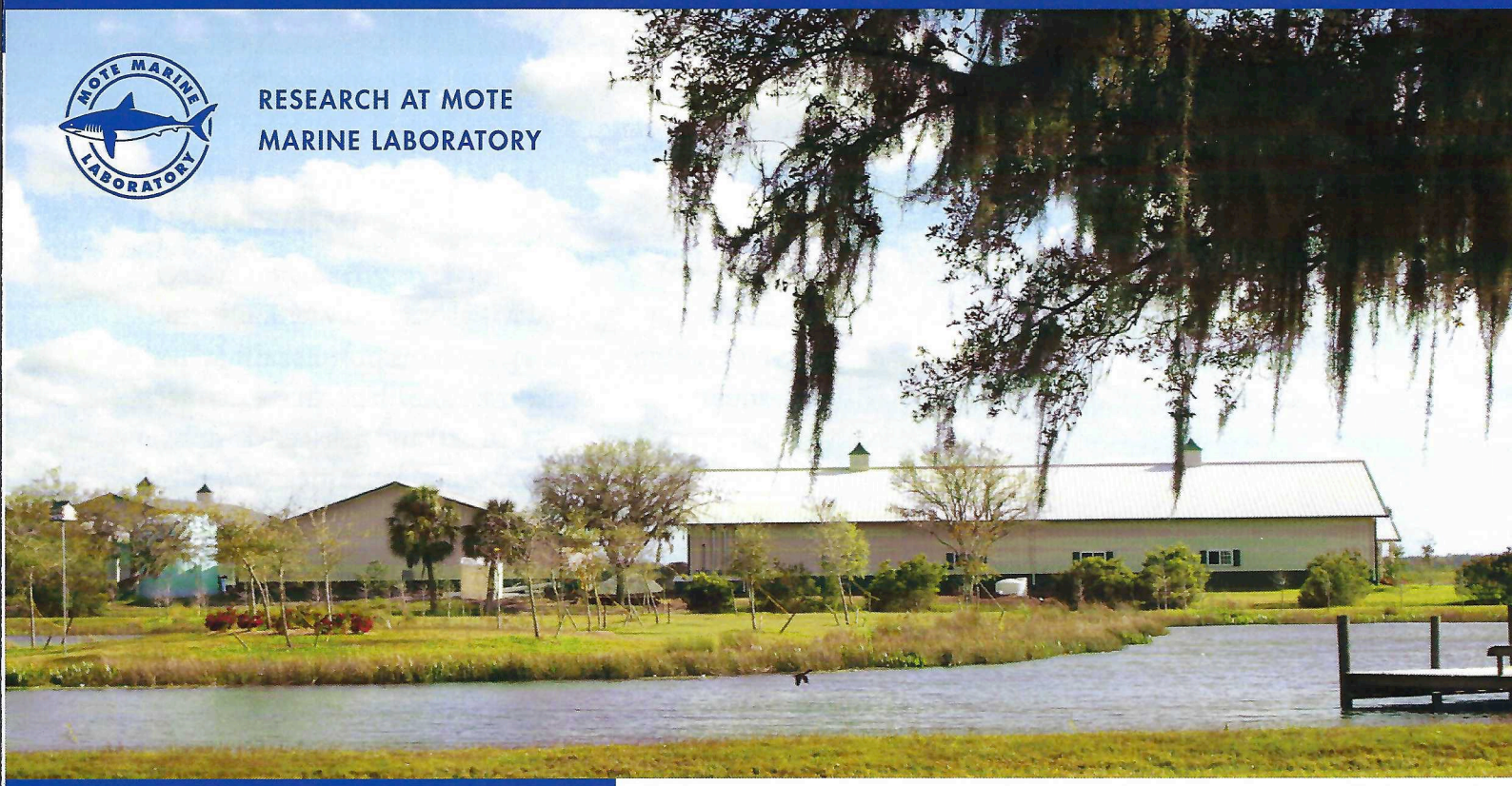
RESEARCH AT MOTE
MARINE LABORATORY



In 2001, Mote Marine Laboratory established its 200-acre Mote Aquaculture Research Park, an R&D facility focused on developing sustainable aquaculture systems that could help feed the world, restock depleted species and support the growth of a viable aquaculture industry in the U.S.

Our research is addressing new ways to clean and re-use fresh and salt water in closed-loop, recirculating systems, to grow fish, sea vegetables and plants for wetlands restoration in ways that sustainably utilize natural resources — especially water.

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Marine & Freshwater Aquaculture Research

A DECISIVE INVESTMENT IN AQUACULTURE SCIENCE

Traditional land-based aquaculture systems utilize large quantities of high-quality fresh or salt water, and discharge that water back into the environment. Even offshore, cage aquaculture techniques require improvement to better address potential environmental impacts. Mote has developed recirculating freshwater systems with minimal water discharge and recirculating salt water zero-discharge systems. Mote Aquaculture Research Park is located nearly 20 miles from any large body of water. There, we are developing innovative, ecologically friendly and cost-effective water filtration and animal husbandry techniques to produce high-value marine and freshwater species. This state-of-the-art facility is replenishing snook, pioneering marine aquaponics research, investigating pompano as an aquaculture species and creating viable business models suitable for adoption by the private sector.

MOTE AQUACULTURE RESEARCH PARK:
RESEARCH AND INNOVATION TO SUSTAINABLY FEED THE WORLD AND RESTORE THE ENVIRONMENT

AQUACULTURE PROJECTS

ABOVE Mote scientist Dr. Ryan Schloesser prepares to release juvenile snook into the wild.

SNOOK

For more than 25 years, Mote has partnered with the Florida Fish & Wildlife Conservation Commission (FWC) to grow high-quality eggs, larvae and juvenile common snook (*Centropomus undecimalis*) to restore wild populations. Mote was the first to mature and spawn this species in captivity in 2006. Larval research today is determining optimal diet for egg production, conditions for larval and juvenile fish growth and survival, and ways to reduce juvenile fish cannibalism and deformities. Mote's Fisheries Ecology and Enhancement Program uses our snook to determine optimal release protocols. Mote also successfully developed spawning technology for Pacific black snook (*C. nigrescens*), another important game fish.

MARINE AQUAPONICS

We have partnered with University of South Florida engineers to develop a prototype marine aquaponics system to farm edible marine plants (sea purslane and saltwort) and fish (red drum) together to demonstrate opportunities for local, community-based food production. Solid fish waste fertilizes wetland-restoration plants grown by Aquatic Plants of Florida.

ABOVE Saltwort plants grown in the aquaponics system at Mote Aquaculture Research Park are fertilized by fish waste.

FLORIDA POMPANO & PLANTS:

In 2003, Mote began breeding research with pompano — a popular food and sport fish with great potential for aquaculture. Today we focus on broodstock nutrition and genetic selection strategies. Juvenile and growout research is improving feeding strategies to produce market-size fish. The pompano growout systems use wetland plants to remove excess nutrients so the salt water can be reused.

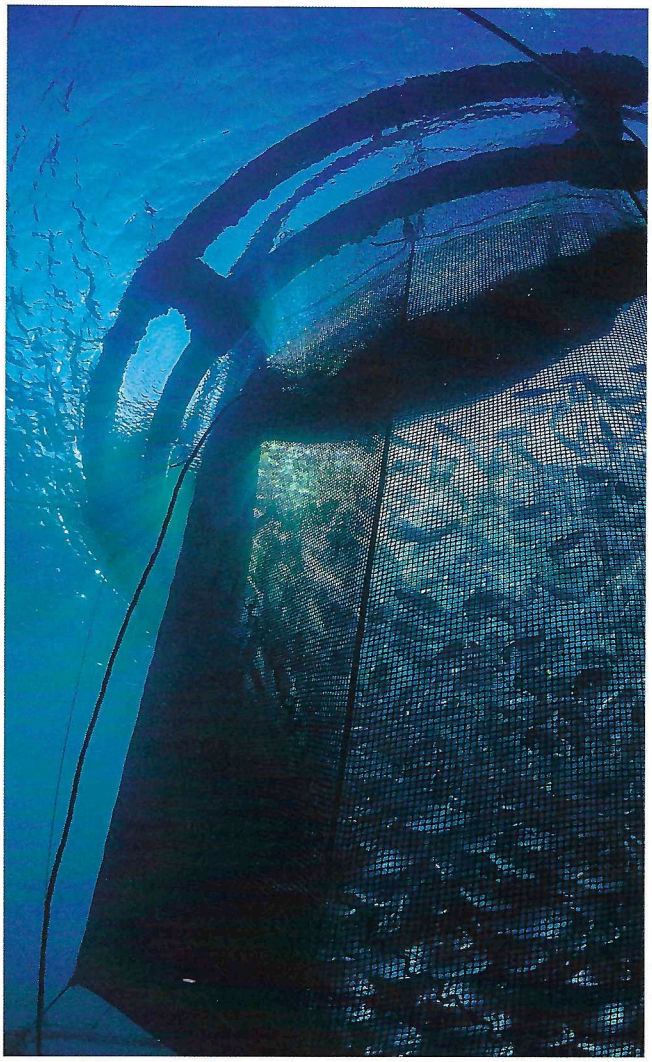
FLORIDA MARINE FISHERIES ENHANCEMENT

In 2007, Mote partnered with FWC and Harbor Branch Oceanographic Institution to develop cornerstone hatcheries for declining wild species, as part of a comprehensive marine restocking program. Technology was implemented in three hatcheries for red drum, allowing us to investigate strategies for inland production of fingerlings for stock enhancement.

OIL SPILL RESEARCH

Mote scientists are studying fish at Mote Aquaculture Research Park as part of the C-IMAGE II research consortium focused on understanding impacts of the Deepwater Horizon oil spill. They aim to develop rapid health-diagnostic tests, based on sub-lethal responses in fishes, that will better predict short- and long-term impacts of oil exposure in Gulf of Mexico fishes.

ABOVE Mote senior scientist Dr. Dana Wetzel conducts an oil exposure study at Mote Aquaculture Research Park.



ABOVE Offshore aquaculture in action. Photo by Giles Lemarchand, courtesy of NOAA.

HATCHERIES FOR OFFSHORE AQUACULTURE

In 2016 the U.S. government opened new opportunities to raise fish offshore in the Gulf of Mexico. To support sustainable use of this fish-farming frontier, Mote is working to pioneer land-based hatchery technology for the Gulf stock of Almaco jack (*Seriola rivoliana*). The project will address improving captive maturation, spawning, health management and larval rearing for more efficient hatchery production of fingerlings.

ECONOMIC IMPACT

Mote is developing technology that industry can utilize to increase year-round, land-based production of fresh seafood and vegetables for consumers, and to expand business opportunities that make the most of limited natural resources. Mote's 2016 research demonstrated that excess mullet from the local Cortez commercial fishery could be used to produce a healthy commercial diet for a farmed, freshwater fish — a major first step toward new income opportunities for west Florida's heritage mullet fisheries and an important line of research the Lab plans to continue with marine fish. Mote's commercial-scale systems have successfully validated methods to optimize water and energy conservation, seafood production and processing. Mote methods and technologies are available for businesses and communities to adopt.

BELOW Mote Aquaculture Research Park in Sarasota, Florida.