AGAINST the TIDE

By Florida Weekly Staff on November 29, 2018

BY PATRICIA HORWELL
phorwell@floridaweekly.com

DR. MICHAEL CROSBY HAS HIGH HOPES FOR the west coast of Florida. The CEO and president of Mote Marine Laboratory, he has recently announced the formation of the Red Tide Institute.

A $1 million grant from The Andrew and Judith Economos Charitable Foundation will establish and support the institute for its first year. Mote scientists expect to make strides toward controlling and mitigating red tide impacts in the Gulf of Mexico. This fall, the state made a $2.2 million investment for red tide research. Mote has already pioneered mitigation technologies. It piloted an ozone treatment system for dead-end canals hit hard by red tide. And its new clay formula was the result of a partnership with Woods Hole Oceanographic Institution, University of South Florida and the Florida Fish and Wildlife Conservation Commission. Although red tide has been around for centuries, this year's bloom took an exceptional toll on Southwest Florida fish, beaches and the tourism industry.

"There is really no single definitive answer to the question of what causes red tide," Dr. Crosby said.

He called it a combination of several forces in nature that come together at the wrong time and in the wrong place, thereby initiating a red tide event.

Dr. Tracy Fanara, manager of Mote's environmental health research program, collects a water sample for testing. COURTESY / MOTE MARINE LABORATORY

"We've been studying red tide for many years, and we've gained an incredible understanding of it," he said. "We know that it occurs 10-40 miles offshore in deeper waters."

The deeper water is pushed up to the surface where winds and tide move it into shore.

Blue-green algae pulls nitrogen from the atmosphere. That nitrogen, added to the ocean water, combined with the right temperature, is part of the recipe. Humanmade waste and fertilizers in the water just enhance the mix. If the currents and winds are in proper alignment the bloom moves in toward shore.

"This is a real game changer," Dr. Crosby said about the infusion of funds into this new venture. "We cannot thank The Andrew and Judith Economos Charitable Foundation enough for providing this critical bedrock for an intensive, sciencebased initiative focused on developing and testing red tide mitigation technologies."

Mote senior biologist Val Palubok from Mote's phytoplankton ecology program studies the biology, behavior and toxicity of living algae cultures — some decades old — in Mote's phytoplankton culture facility. ALEXIS BALINSKI / MOTE MARINE LABORATORY

A good first step

The new techniques already developed by Mote scientists are only the beginning. Dr. Crosby called it a good first step. "We are going to leverage on (what we've already discovered) and unleash the innovative capabilities of Mote scientists working with our partners throughout the world."

He said scientists are currently looking at several therapies, concentrating on how to reduce red tide's impact.

"We'll be looking at some novel technologies that have never been used before, and I expect we will be able to move the ball down the field and actually develop dozens of different approaches."

Mote has already brought on new staff, and Dr. Crosby plans to bring on more.

"We are building an incredible team of researchers with decades of experience in many disciplines. We want to bolster our current team with additional players who have exceptional

experience and capabilities to complement and add to our research team."

HEIL

Dr. Cynthia Heil, whom Dr. Crosby calls "a world-class scientist," has been hired to lead the institute. She'll come on board Jan. 1 as senior scientist for the HAB (harmful algal blooms) Mitigation Research Program and director of the Red Tide Institute. She comes to Mote from Bigelow Laboratory for Ocean Sciences in Maine, where she developed an independent research program focused on water quality, harmful algal blooms and ecosystem management. She previously served as senior research scientist and administrator and harmful algal bloom group Leader for FWC's Fish and Wildlife Research Institute, and led earlier algal bloom research at the University of South Florida's College of Marine Science.

Dr. Heil's new HAB Mitigation Research Program will complement five ongoing and diverse Mote research programs working on Florida red tide. She also brings new expertise in mitigating a major Florida red tide impact: airborne toxins that cause respiratory irritation in humans.

"I am absolutely thrilled to have the opportunity to work with the world-class Mote scientists on Karenia (the organism that causes red tide) research again," Dr. Heil said. "Through Mote's new Red Tide Institute, I hope we can begin finding practical solutions to alleviate the impacts of Florida red tide and to safeguard human health and our marine environment."

Developing new technologies

The team will make a focused effort to develop new technologies, and Dr. Crosby expects to be able to deploy some of these initiatives during the next three to five years. There are already many theories out there, but Dr. Crosby cautions that some might cause more harm than good. Many fall by the wayside because, although they might kill off harmful algae, they might also cause harm to other species.

“We have to be very careful that whatever we develop is not going to do greater harm than red tide has already caused,” he said. “But there will be some very high expectations.”

Dr. Vince Lovko, Manager of Mote’s Phytoplankton Ecology Program, points to a “living dock” structure with attached filter-feeding organisms whose ability to remove red tide from limited areas is being investigated by Mote scientists. COURTESY OF MOTE MARINE LABORATORY

Massive red tide fish kills and breathing difficulties have been documented as early as the 1500s. But there is no question that, with the increased number of humans living here now, the conditions that contribute to red tide have been exacerbated.

Mote has spent years cultivating and reviving the snook population here. This year, just as they were about to spawn, thousands were killed by toxic bloom and lay dead on the beaches of Gasparilla Island.

“We could lose an entire generation of fish,” Dr. Crosby said.

He added that Mote is currently growing a new group of snook in its hatchery and will be releasing them into Charlotte Harbor to offset the lost generation.

In contrast, the turtle-nesting season this year resulted in a record number of nests. Although turtles, dolphins and manatees are on the front lines in the red tide battle, hatchlings were not affected. Nesting female turtles do not eat and are not as susceptible to the red tide toxins as dolphins and manatees that have consumed infected fish. The hatchlings make their way into the water and won’t consume any food until they are well past the shoreline. Scientists don’t expect to see any changes in nesting numbers until the current crop of hatchlings is mature enough to lay eggs.

This year’s bloom was historic also because of its migration to the east coast of Florida. Dr. Crosby said it looped through the Keys, where it was a bit patchy due to the coral reefs, and then around to the east coast.

“This was not unprecedented,” he said, although red tide does tend to remain centered on the

west coast.

Science for all the world

The institute's efforts are expected to also help in lessening the impact of brown and mahogany tides as well as additional harmful algal blooms in other parts of the U.S. and throughout the world.

This effort will continue for several years, but additional funding will be necessary. Dr. Crosby estimates that the project will cost about $3 million a year.

"Thanks to the Economos donation of $1 million, we are able to launch the project," he said. "I hope their example will cause other philanthropic angels to come forth from our communities in Southwest Florida — and match what the Economoses have done to ensure a winning effort for our community and around the world."

For more information about Mote Marine Laboratory's ongoing research, visit www.mote.org. ¦