CENTER FOR
TROPICAL AND SUBTROPICAL
AQUACULTURE

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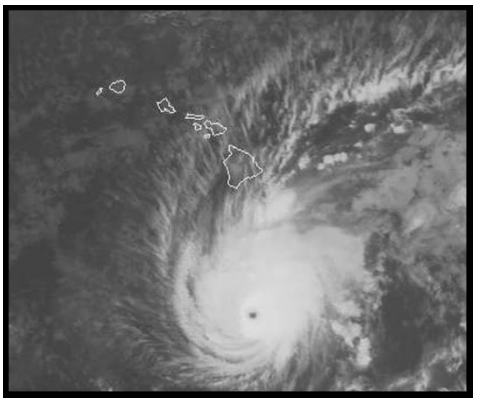
Letter from the Director



Aloha,

As you may know, a major hurricane was forecasted to hit the Hawaiian islands last week. Thankfully, it shifted direction and we were spared a direct hit. However, in the days leading up to the anticipated arrival of the storm, fears about food security became a major topic of discussion. In the remote Pacific islands, the impact of storms can be felt for a long time. Not only do we almost completely depend on the imported goods that arrive by boat, but storms can impact our farmlands and fishing waters, disrupting the local food production we do have in place.

Unfortunately, climate change is intensifying storms across the globe. It's also raising water temperatures, forcing the northern migration of some species typically only found in the Pacific Islands. Pelagic fish like tuna might eventually be found at higher latitudes, further impacting the availability of fish in our region. In short, there are many factors in our ever-changing world that are affecting the islands' reliance on natural resources particularly seafood. If we cannot get the food we want or need from the ocean, culturing it ourselves will become the only option. As I have mentioned in a previous newsletter, it is time for us to broaden the definition of aquaculture.

Increased collaboration between the aquaculture and fisheries industries -- and the integration of management strategies -- can help our environment mitigate and/or recover... **Read More**

New! CTSA Sea Cucumber Hatchery Manual

CTSA has released a new "Hatchery Manual for Sea Cucumber Aquaculture in the U.S. Affiliated Pacific Islands" (CTSA Publication 163). The manual is available for free download in the Publications section of the CTSA website; click here to view (pdf).

The release of the manual co-incided with a special seminar last month led by sea cucumber and pearl oyster expert Masahiro Ito. The event was live streamed and is available for viewing on our Facebook page.

If you are interested in learning more about Ito-san's work with pearl oyster aquaculture in the FSM, click here to watch a short video CTSA produced in 2011

Challenges and Opportunities in the Development of Offshore Aquaculture in the Pacific Islands

CTSA is currently supporting a coral grouper project led by the Palau Aquaculture Cooperative Association and Indigo Seafood Palau. The purpose of the project is to test the feasibility of commercial cage culture of coral grouper in Palau. Project work group member and Co-Founder of Indigo Seafood James McVey has written an article on his experiences prior to and during the CTSA project. The full article is available on the CTSA website; the following is an excerpt:

"Indigo Seafood, working with the Palau Aquaculture Cooperative Association (PACA), a non profit organization of giant clam farmers and others with an interest in aquaculture, received funding from the UN's South Pacific Communities Directorate for two offshore, submersible cages for testing the feasibility of grouper culture in Palau. This resulted in two 212 m3 cages installed in 100 feet of water two miles offshore of Airai bay on the big Island of Babelthuap in Palau in 2016. This accomplishment was only possible because of 6 years of preparation and work on obtainment of all the government permits and leases to do business in Palau.

Doing business in Island communities is not easy and it is essential to become a welcome component of the community. Many smaller set backs occurred that were difficult to plan for: this included: Theft of materials in storage, night time vandalism of cages, 2 sunken boats with expensive repairs, difficulty obtaining fingerlings from local and international hatcheries. Difficulty with reproduction and also with transportation. Very expensive testing and transportation costs, disease of fingerlings from local hatchery, causing over 70% mortality in first 75 grouper fingerlings.

During 2017 PACA/ Indigo received a small grant from CTSA to test the culture of the grouper *P. Leopardus*, the leopard Grouper, in our cages on the ocean lease. We were to test the effects of density on growth rate of this valuable species. The juveniles were to come from either the Palau Community College Hatchery in Palau or from the Oceanic Institute in Hawaii. We hired divers, outfitted two boats, bought feeds, purchased nursery nets but we were only able to get 75 juvenile grouper from the PCC hatchery. We stocked the nursery net in only one cage to see how this limited number of grouper would adapt to the offshore conditions. We also had access to a few thousand rabbitfish, that we planned to use to help clean the cages clear of fouling and we stocked them outside of the nursery net in the grouper cage. The rabbitfish did a great job keeping the cage clean and adapting to the feeds we provided to round out their nutrition. The grouper exhibited lesions on their skin that apparently came with them from..." **Read More**

Auburn farmed-oyster study aims for safety on the half shell

USDA
United States Department of Agriculture
National Institute of Food and Agriculture

An Auburn University marine scientist has landed a $456,646 NIFA grant to help ensure that farmed oysters bound for the premium half-shell market are as safe as possible for human consumption. The grant, one of 13 competitive AFRI food safety awards, will fund a three-year study to determine whether an oyster farm's geographic location, handling practices, and choice of equipment affect

Vibrio levels in farm-raised oysters. Vibrio are bacteria that occur naturally in warm ocean waters, such as the Gulf of Mexico... **Read More**

AquaClip: Scientists develop sustainable feed for Nile tilapia using marine microalga co-product

Scientists at Dartmouth College have demonstrated that a marine microalga co-product can replace fishmeal as an ingredient in feeds for Nile tilapia.

The Dartmouth team's latest work replaces fishmeal with the microalga co-product, *Nannochloropsis oculata*, which is rich in both protein and omega-3 fatty acids, including eicosapentaenoic acid. The co-product is available at commercial scale and continued increases in supply are expected.

The study is the first of its kind to evaluate replacing fishmeal with a co-product in feed designed specifically for Nile tilapia, and the results demonstrated that the co-product had higher protein content than the whole cells but had lower digestibility than whole cells. The co-product showed the highest digestibility of lysine, as well as the highest eicosapentaenoic acid (EPA) digestibility. The team produced and evaluated several feeds with varying percentages of the co-product replacing fishmeal. When 33 percent of fishmeal was replaced with the co-product, the Nile tilapia showed similar growth, survival and FCR to those on the control diet containing fishmeal.

The team hypothesizes that the co-product may need to be enhanced with enzyme(s) to maximize nutrient availability and counter the lower digestibility observed in the experiment.

"The possibilities for developing a sustainable approach to aquaculture are exciting. Our society has an opportunity to shift aquafeed's reliance on fish-based ingredients to a fish-free product that is based on marine microalgae, and our findings provide new insight into how we can get there," said lead author, Pallab Sarker, a research assistant professor at Dartmouth.

Source: Aquafeed.com / **Read Article**

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The Center for Tropical and Subtropical Aquaculture (CTSA) is one of five regional aquaculture centers in the United States established and funded by the U.S. Department of Agriculture's National Institute of Food and Agriculture (NIFA) under grants 2012-38500-19566, 2014-38500-22241, and 2016-38500-25751. The regional aquaculture centers integrate individual and institutional expertise and resources in support of commercial aquaculture development. CTSA was established in 1986 and is jointly administered by the Oceanic Institute of Hawaii Pacific University and the University of Hawaii.

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