



## Letter from the Director

Aloha,

It's hard to believe that it has been over a year since Aquaculture America took place in Honolulu in February 2020; the conversations and presentations are still fresh in my mind. Shortly after the conference, the Covid-19 pandemic forced the lock down of the U.S. and most other countries, altering our world and the ways that we communicate and do business. The new partnerships and ideas for industry innovation discussed at Aquaculture America could no longer be developed in person and were instead forced to move online. While there was certainly a learning curve in the beginning, I am thankful for the technologies that have enabled us to continue our work and even brought us closer together during the pandemic, in spite of social distancing. This includes new technology that has allowed us to get more information at our fingertips.



I have personally had the chance to sit in more meetings than I would in a typical year, and I have enjoyed catching up on what's happening in aquaculture across the world. The developments in other locations --particularly Asia-- have stimulated many new thoughts in my mind. In addition to contributing 92% of global aquaculture food production, countries in Asia are moving sustainable aquaculture forward with the innovation of new technologies. A few nights ago I attended a webinar by INFOFISH sponsored by the Asia-Pacific Fishery Commission; the title of the webinar was "Antimicrobial resistance is simple to understand, yet it is often misunderstood." The discussion focused on the overuse of antibiotics leading to antimicrobial resistance on farms, and the importance of producing seafood that is nutritious, safe and healthy for the consumer and also respectful of the environment. Considering the efficacy of the current COVID-19 vaccine development efforts, there is no doubt that vaccines are the best solution for aquatic disease prevention as well. Hopefully, with international cooperation we will develop cost-effective vaccines to eliminate current and future aquatic disease threats. COVID-19 has also prompted us to think about new market channels for seafood to reach more consumers. We must find an innovative way to address these issues as a global industry moving forward.

With this in mind, I encourage you to please start thinking about regional funding priorities for the next development cycle. CTSA will release an official request for FY21 funding priorities input next month, but we welcome your feedback at any time. You may email [mbrooks@ctsa.org](mailto:mbrooks@ctsa.org) or me with your suggestions on what is important for aquaculture development in our region and why. We will gather and review all input from industry stakeholders to prepare our FY21 Request for Pre-Proposals (to be released in May).

Dr. Cheng-Sheng Lee  
Executive Director, CTSA

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## CTSA Project Update: Molecular Stomach Content Analysis of First Feeding Larval Fish

The research team leading the project "What's in the gut? A Metabarcoding Approach to Examining Diet in First Feeding Larvae" recently presented a talk at Hanauma Bay on the status of their CTSA-funded work. The video presentation is available for viewing on [YouTube - click here to watch](#). The following is a brief description of the project prepared by UH graduate student Cassie Ka'apu-Lyons:

The demand for locally produced seafood is growing, despite

dwindling supply of wild-caught fishes. Aquaculture provides a beacon of hope to meet this demand, and potentially a great opportunity for coastal economies in Hawai'i and across the nation. However, successful marine fish aquaculture is hampered by the inability to raise most marine fish larvae through metamorphosis. The central problem is high mortality in the larval stages, due to disease and starvation. Disease can be controlled with sanitation and other remedial measures, while starvation remains intractable due to largely inappropriate feeds. This is primarily due to our lack of understanding about the larval fish diet and how diet changes through early developmental stages.



Fortunately recent advances in next-generation sequencing (NGS) technology offers great promise for rapid, and cost effective diet analysis. This method can recover all the prey items in the larval fish gut, including those that are decomposed or otherwise impossible to distinguish using visual identification. Molecular stomach content analysis (mSCA) can circumvent the challenges of laborious feeding trials as well as limitations of traditional (visual) stomach content analysis, allowing investigators to examine a multiplex of species and life-history stages from various locations. This project is evaluating the diet of wild-caught marine fish larvae of commercial interest, including yellow tang, and developing mSCA as a tool to detect and quantify prey in the stomachs of larval fishes.

To date the research team has applied this technology to a small subset of larval fish, varying in age, size, and species to show proof on concept. They have been able to show that they can successfully identify prey items from the stomachs in the larve of various fish species. Continued successful application of mSCA surveys will bolster existing aquaculture efforts with a rapid and cost effective tool that offers remarkable potential to identify diet in first-feeding fish larvae with accuracy far surpassing conventional means. Data derived from this study will greatly enhance the baseline knowledge of larval feeding requirements. Further, this technology will enable industry to resolve diets in multiple species of interest, allowing growers to identify natural nutritional requirements in lucrative species that have been difficult to grow out in captivity.

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## Explore the 'Beta' Version of the New CTSA Website

CTSA is excited to announce that we are launching our new website next week. The CTSA website has undergone a full remodel under the direction of the ongoing Information Services project, which spent several months working with Hawaii based designers to create our most robust program website to date. The site is undergoing final edits before going live on [ctsa.org](http://ctsa.org), but stakeholders are welcome to explore and provide feedback on the [beta version](#) of the site in the meantime.



CTSA is pleased to present this information resource for aquaculture stakeholders in the Pacific region and beyond. In addition to housing the existing Regional Aquaculture Center resources our stakeholders have come to count on, the redesigned website features a contemporary design and new comprehensive search engine that allows users to search current and past CTSA projects and publications based on species, location, technology and lead institution. The new site also features a layered regional map that users can utilize to explore CTSA projects throughout the region.

Next month's issue of e-Notes will dive deeper into the new website and will include a short video highlighting some of the new user friendly features of the site.

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## Aquaculture Announcements

### [New Free App Provides Ocean Temp, Salinity and More](#)

Pulse is a free web service that provides worldwide ocean temperature, salinity, and chlorophyll data; it was built especially for aquaculture farmers. Anyone can use it by visiting [www.pulse.umitron.com](http://www.pulse.umitron.com) or by downloading the app in the iOS or Google play store.

### [Sign Up Now to Participate in the 2022 Census of Aquaculture](#)

The 2022 Census of Agriculture is right around the corner and USDA NASS is making every effort to count all aquaculture producers in the United States. Participation in the Census shows Congress, state and local governments and federal and state agencies that aquaculture is a growing, diverse and vibrant economic force important to rural coastal and inland communities. In order for U.S. aquaculture to gain traction at the federal or state levels, legislators and federal and state agencies representatives need to understand the

scope and breadth of U.S. aquaculture. And the jobs and income created and sustained by rural, urban and coastal farms.

All farm specific data is held confidential, NOT shared with other agencies and protected by criminal statutes. Please support and strengthen U.S. aquaculture by promoting participation in this important Census.

[Click here to participate.](#) Once you have signed up, you might receive a short survey in the next two years to further categorize your operation. But most likely, you will not receive a survey until the 2022 Census of Agriculture in January or February, 2023.

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## AquaClip: Big Island Finfish Farm Hopes To Lead The Way In Sustainable Aquaculture

About a half-mile offshore from Unualoha Point in North Kona, Blue Ocean Mariculture's submersible pens are teeming with potential for what the company sees as a better way to raise seafood.

And as the operator of the nation's first finfish farm certified by the Aquaculture Stewardship Council, an organization devoted to encouraging environmental sustainability and social responsibility, the company believes it's a model for others around the country, vice president of sales David Valleau said.

"I definitely believe that Blue Ocean is an example, by our commitment to healthy fish and our oceans and our employees and our communities," Valleau said.

Each of Blue Ocean's six pens, anchored to the seafloor 82 feet below, houses between 100,000 and 130,000 almalco jack, branded as Hawaiian Kampachi. Blue Ocean's operations also include a hatchery at Hawaii Ocean Science and Technology Park south of the Ellison Onizuka Kona International Airport. Wild-caught adult fish produce eggs and the hatched fish spend three months in the hatchery growing big enough to be transferred to the offshore pens. The fish grow in the pens for another 12 months before they're harvested.

During their year in the submersible pens, the fish swim against a consistent and temperate current of "the cleanest seawater you can find," Valleau said, resulting in the texture and flavor that's made the fish popular among chefs and restaurants. It's also a fish that can be propagated in captivity — which Valleau said is rare among marine fish and the reason it was selected. It's local to Hawaii waters, and is consistently available year-round. Blue Ocean Mariculture doesn't use antibiotics or hormones, and the feed uses a balance of fish meal, fish oil and non-GMO grain.

"It's a sustainable product," Valleau said. "We can keep growing more and more of these fish without negatively impacting other ecosystems. That's really the difference between this fish and any other protein that you buy and consume."

Source: Civil Beat // [Original Article](#)

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This newsletter is written and prepared by the CTSA Information Specialist Meredith Brooks.

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Center for Tropical and Subtropical Aquaculture  
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