CENTER FOR TROPICAL AND SUBTROPICAL AQUACULTURE

Regional e-Notes ~ October 2026 ~ Volume 18, Issue 10

Letter from the Director

Aloha,

October is National Seafood Month, and it is always a good time to celebrate the seafood produced in our region. Each year, NOAA Fisheries uses the month to recognize the fishermen, farmers, and many others who bring seafood to our tables. The United States is known as a global leader in sustainable seafood, both wild-caught and farmed, and our local farmers help make that possible. As the month comes to a close, I encourage you to keep choosing locally grown seafood and supporting the people who work hard to produce it.

Not everyone recognizes, as we do, that aquaculture will play an ever-growing role in supplying healthy seafood. Earlier this month, the New York Times published an article questioning whether fish farming is sustainable. Rather than focus on the criticism, I see an opportunity to share our story. Our industry has worked for many years to farm responsibly, from reducing the use of marine ingredients in feeds to developing local feeds from seafood processing byproducts that would otherwise end up as waste. That message has not always reached consumers, and we need to do more to share it. I encourage us to work together to show consumers how we are making aquaculture more sustainable; you can read more about these efforts in a separate article in this issue.

Telling our story depends on having strong results to share, which is why careful project development is so important. Our FY26 process is moving smoothly. Every applicant invited to submit a full proposal after the pre-proposal stage has done so, and the proposals are now with our external review panel. Independent review is a critical part of our program. Reviewers bring expertise from many specialties and help make sure each project is technically sound and addresses the needs our industry has identified. Several reviewers have already returned their comments, and their feedback will help our investigators strengthen their projects. We know how busy our colleagues are, and we sincerely thank everyone who has given their time to this effort.

Strong projects are not the work of one group; researchers, reviewers, industry members, and our Industry Advisory Council and Technical Committee all play a role. As I say often in this newsletter, we all need to work together to achieve our shared goals.

Mahalo,
Dr. Cheng-Sheng Lee
Executive Director, CTSA

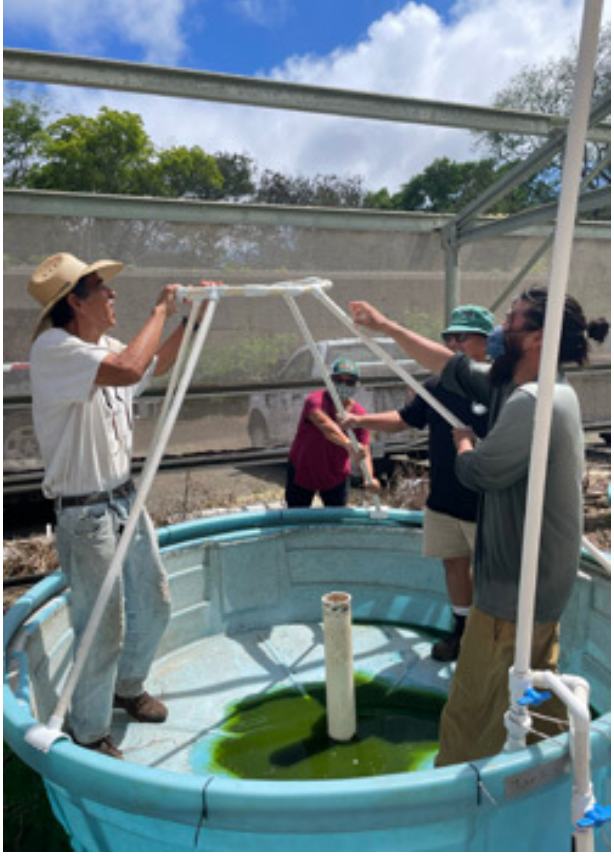
CTSA Project Update: GoFish Hawai‘i Builds a Pipeline of Integrated Aquaculture Farmers

Excerpts from the Year 1 Annual Progress Report submitted by the GoFish Hawai‘i project

Hawai‘i imports the large majority of its food and seafood. People who want to start producing fish locally often face technical, business, and workforce barriers before their first harvest. Since 2020, GoFish Hawai‘i has worked to lower those barriers. The program gives beginning farmers, Native Hawaiian producers, veterans, educators, and others hands-on training in how to raise fish alongside crops.

Building on the program's success, CTSA is supporting the FY24 project "GoFish Hawai'i: Developing New Opportunities for Integrated Aquaculture in Hawai'i." The project's focus is to help trainees turn what they've learned into commercially viable businesses and careers. Over two years, the project aims to:

- train 50 participants in commercial aquaponics production and business,
- help alumni market their fish through Reelerapp.com, an online seafood marketplace, and
- place alumni in paid apprenticeships at Kunia Country Farms.



In Year 1, the team delivered the program's fourth cohort at CTAHR's Waimānalo Research Station. The training combined classroom instruction, field demonstrations, hands-on practica, and self-paced online learning. The spring curriculum covered system design, fish husbandry, water quality, crop nutrient management, and business economics. A public aquaponics field day in February 2026 extended the training to a wider audience.

By the midterm report, 15 registered trainees and 35 to 40 additional practicum participants and alumni had taken part. That is roughly 50 to 55 people reached in the first half of the project, which keeps the program well on pace toward its two-year training goal.

The team also added more rigor to the curriculum. Working with an assessment specialist, they developed four online modules, each with defined learning outcomes. Quizzes test applied knowledge, such as working through a nitrogen-cycle problem. With these tools, the program can measure what participants learn and not just how satisfied they are.

Participant feedback was strongly positive. All respondents were satisfied with the course, 60 percent were very satisfied, and every respondent would recommend it to others. Participants rated their confidence in understanding aquaponics at an average of 4 out of 5. Eighty percent said they were very likely to apply what they learned, and the same share expressed interest in future GoFish opportunities.

The training also reached students outside the program. One fourth-cohort participant brought her aquaponics knowledge to a local elementary school's STEM initiative. Her fourth-grade engineering activity engaged 180 students and shows how GoFish training can carry into classrooms and future workforce pipelines.

Year 2 will focus on connecting trainees with the aquaculture industry. In Year 1, the team introduced business planning, marketing, and production economics to prepare alumni for direct-to-consumer sales.

They also continued coordinating with the project's online marketplace and farm partners. Alumni participation and sales on the platform, along with formal apprenticeship placements, are scheduled for the coming year. This is the step that turns training into revenue and jobs, and CTSA looks forward to reporting on that progress.

The team has also submitted two abstracts to Aquaculture America 2027, which will be held in Honolulu next February. One describes the GoFish training model across four cohorts, and the other describes the school partnership. The team also submitted a proposal to expand GoFish research and community outreach.

UH News recently featured GoFish Hawai'i, including its history since 2020 and the story of an alumnus now building a commercial aquaponics farm on O'ahu. We are pleased to share that article as this month's AquaClip below.

Telling the Story of Sustainable Aquaculture

Earlier this month, the New York Times published an article questioning whether aquaculture is sustainable. Drawing on an investigation by the Outlaw Ocean Project, the article argued that because many farmed species are fed fishmeal and fish oil made from wild fish, aquaculture adds to the pressure on wild fish stocks. For farmers and researchers who have spent decades improving their practices, this kind of coverage can be discouraging. It also tells us that much of the progress our industry has made is not reaching consumers, and that is something we can work to change.

Aquaculture is now a major part of the world's food supply. In 2024, farms produced 103 million tonnes of aquatic animals, or 53 percent of all aquatic animal production worldwide. It was the first time aquaculture production passed 100 million tonnes (SOFIA 2026). Here at home, NOAA estimates that about 80 percent of the seafood Americans ate in 2023 was imported. As demand continues to grow, the question is not whether we farm seafood, but how we farm it responsibly and how well we explain that work to the public.

How Aquaculture Feeds Have Changed

Feed is often the first concern people raise about fish farming, and it is also one of the areas where our industry has changed the most. A 20-year review published in Nature in 2021 found that gains in feed efficiency and fish nutrition have lowered the fish-in, fish-out ratio for all fed species. Norwegian salmon farming, one of the best documented sectors, shows how large these changes have been. In 1990, about 90 percent of the ingredients in Norwegian salmon feed came from marine sources. By 2020, fishmeal made up 12 percent of the feed and fish oil 10 percent, with most of the rest coming from plant proteins, plant oils, and other ingredients. Between 1990 and 2013, the amount of wild fish needed to supply the fishmeal for one kilogram of Norwegian salmon fell from 4.4 kilograms to 0.7, and the industry became a net producer of marine protein.

Today, a growing share of the marine ingredients used in aquaculture feeds comes from byproducts rather than whole fish. According to IFFO, The Marine Ingredients Organisation, byproducts from fish processing now account for about 35 percent of global fishmeal production and 57 percent of fish oil production.

CTSA has supported this work in our region for many years. In the Republic of the Marshall Islands, a CTSA project developed a feed for Pacific threadfin (moi) made mainly from bycatch from local commercial fishing that would otherwise usually be discarded. The researcher who led that project is now leading a new CTSA project that builds on this work in Hawai'i, using fish waste from commercial fishing along with other local ingredients to create locally made feeds for fish and shrimp. CTSA has also supported several other projects exploring local feed ingredients made using products that would otherwise be discarded as "waste." In one, researchers used tofu wastewater to grow a fungal protein that replaced 25 percent of the fishmeal protein in shrimp feed without affecting growth. In another, researchers turned culled papaya into a yeast meal that replaced up to 25 percent of the fishmeal in tilapia diets.

Aquaculture's Place in a Sustainable Food Supply

Discussions about feed often leave out the many farmed products that don't require any feed at all. According to NOAA, shellfish and seaweed farms typically require no feed, fresh water, or fertilizer. Shellfish remove nitrogen from the water as they filter feed, providing valuable benefits to the environment; a single adult oyster can filter up to 50 gallons of water a day. These farms can also provide habitat for fish and crustaceans.

Seafood is also important for our health. The Dietary Guidelines for Americans 2025-2030, released in January 2026, now recommend three or more servings of seafood per week, up from at least two servings in earlier guidance. Yet a 2025 CDC report found that only about one in four U.S. adults, and fewer than one in ten children and teens, eat seafood even twice a week. Farmed seafood can help close that gap.

Like all food production, aquaculture has an environmental impact, and we should say so openly. Being honest about our challenges builds trust and gives us the chance to explain how they are being addressed. NOAA notes that U.S. marine aquaculture "operates within one of the most comprehensive regulatory environments in the world," with rules covering disease, wastewater, siting, seafood safety, medication, feed, and the protection of marine life. Wild fisheries are also improving, and in 2023, 72.6 percent of global landings came from biologically sustainable stocks.

How CTSA Shares the Story

Since its founding in 1986, CTSA has worked to share the results of the projects it funds with farmers, policymakers, students, and the public. Our Aquaculture in the Pacific Islands video series covers topics such as sustainable feeds, aquaponics, marine finfish hatchery training, and the Micronesian pearl industry. The Island Farmer Spotlight series profiles farmers and businesses across the region. For several years, we also produced Progress Reports to the Public, short videos that explained individual projects in plain language.

We reach students through the A.Q.U.A. (A Quest to Understand Aquaculture) Education Program, a curriculum that covers the basics of aquaculture, its business and history, and its role in human nutrition. The curriculum was first published in 2011, and new lessons were added in 2023. Our monthly Regional e-Notes newsletter keeps readers informed about news across the region, and our fact sheets, workshop materials, and Project Impacts reports are available on our website. We also work directly with farmers and communities; hundreds of local technicians across the region have received extensive training through CTSA projects in hatchery technologies, animal husbandry, grow-out, feed manufacturing technologies, pearl grafting and accessory making, and more.

We are now preparing a new promotional video that will highlight the impacts of our program and the positive benefits of aquaculture across the Pacific and beyond. We look forward to sharing it with you soon.

Reaching More Consumers
Outreach to people who already follow aquaculture is important, but the larger challenge is reaching consumers who rarely think about where their seafood comes from. There are many ways our industry can do this together:

- Work with chefs, restaurants, and grocery stores to tell customers where local farmed seafood comes from, through menus, signs, and product labels.
- Partner with dietitians, doctors, and health educators, who are trusted sources of nutrition advice.
- Open farms and hatcheries for tours and community events so people can see the work firsthand.
- Share short videos and photos on social media that show the people behind our farms.
- Build relationships with local reporters so they have accurate information and knowledgeable contacts when aquaculture is in the news.
- Take part in seafood festivals, farmers markets, and cultural events across the region.
- Support teachers in bringing aquaculture into the classroom through programs such as A.Q.U.A.
- Share data openly on feed ingredients, sourcing, and environmental monitoring.

No single organization can do this alone. Farmers, researchers, extension agents, chefs, and educators all have a role in helping consumers understand how their seafood is produced. When people see the care that goes into responsible aquaculture, they can confidently choose sustainable, locally grown seafood.

Regional Aquaculture Announcements

Call for Abstracts: Hawai‘i Aquaculture Showcase at Aquaculture America 2027 (Deadline Extended to November 4)

A special session, “Hawai‘i Aquaculture Showcase,” is being organized for Aquaculture America 2027, to be held February 21–24, 2027, at the Hilton Hawaiian Village on O‘ahu. If enough abstracts are submitted, a companion session, “Pacific Islands Aquaculture Showcase,” may also be offered. The session invites presentations on institutional or private-sector aquaculture initiatives that may not fit the traditional “present your data” format but that together show how Hawai‘i’s stakeholders are moving aquaculture forward in innovative ways. The abstract deadline for this special session has been extended to Wednesday, November 4, 2026. To present, submit your abstract using the session title “Hawai‘i Aquaculture Showcase,” and send a copy to Dr. Maria Haws (haws@hawaii.edu) by the same date.

Hawai'i Agriculture Conference (AG2026) in Waikoloa Nov. 9-10

The 2026 Hawai'i Agriculture Conference will be held November 9-10 at the Waikoloa Beach Marriott Resort & Spa. Since 2002, this event has provided a place for the agricultural community to explore, learn, and network with agricultural leaders, specialists, and affiliated stakeholders. The meeting is an opportunity to make sure our sector is integrated with our State's wider food production and natural resource management sectors. Some highlights include a 1-hour aquaculture session focusing on regenerative and restorative aquaculture, organized by HAAA and industry representatives; Neil Sims (Ocean Era and Kona Limu Company) will be part of the keynote panel; and an Agrifood Innovation Pitch Competition is being organized by Jim Wyban. Learn more at hiagconference.org.

USDA Disaster Assistance Available for Producers Impacted by Hurricane Lowell

The U.S. Department of Agriculture (USDA) has technical and financial assistance available to help Hawai‘i farmers, ranchers, and aquaculture producers recover from Hurricane Lowell. Of particular interest to our industry, the Emergency Assistance for Livestock, Honeybees, and Farm-Raised Fish Program (ELAP) may cover losses of purchased or produced feed intended for eligible farm-raised fish, along with physical inventory losses of the fish themselves. Producers must submit a notice of loss and payment application to their local Farm Service Agency (FSA) office by March 1, 2027, for 2026 losses. Producers with Noninsured Crop Disaster Assistance Program (NAP) coverage must file a notice of loss within 15 days of the loss becoming apparent, and those with federal crop insurance should contact their agent within 72 hours of discovering damage. FSA also offers low-interest emergency loans in designated disaster counties to help replace essential property, purchase inputs such as feed and equipment, and refinance farm debts.

USDA encourages impacted producers to report all losses to their local USDA Service Center as soon as possible and to gather farm records, inventory, receipts, and photos of the damage.

AquaClip: GoFish Hawai‘i advances local aquaculture, food security

Hawai‘i farmers are learning how to integrate aquaculture to their operations through GoFish Hawai‘i, a University of Hawai‘i at Mānoa program designed to expand food security. Led by Assistant Professor Kai Fox and Professor Ted Radovich, the program operates at the College of Tropical Agriculture and Human Resilience's Center for Applied Research and Extension Services in Waimānalo.

Since the program began in 2020, GoFish Hawai‘i has trained more than 70 participants. The aquaculture program combines five workshops, field experience, technical assistance and online learning. Participants include beginning farmers, Native Hawaiian producers, military veterans and local educators.

The program's goal is to increase commercial aquaculture across Hawai‘i and boost the state's food security.

“GoFish was developed to respond to community demand for practical, locally relevant training that helps participants pursue aquaculture as a business, career, or addition to an integrated venture on an existing farm,” Fox said.

Beginning aquaculture students study fish husbandry, aquaponic system design, water quality management, plant nutrition and business economics. Students learn to use nutrient-rich water to produce a wide variety of vegetables and fruit trees, reducing fertilizer costs and water consumption...

Source: University of Hawai'i News // Full Article

This newsletter is written and prepared by the CTSA Information Specialist Meredith Brooks.
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 active grants 2022-38500-38099, 2023-38500-40707, and 2024-38500-42306. The regional aquaculture centers integrate individual and institutional expertise and resources in support of commercial aquaculture development.
CTSA was established in 1986 and is administered by the University of Hawaii.

USDA National Institute of Food and Agriculture
U.S. DEPARTMENT OF AGRICULTURE

UNIVERSITY of HAWAI'I at MĀNOA
COLLEGE OF TROPICAL AGRICULTURE AND HUMAN RESILIENCE

Center for Tropical and Subtropical Aquaculture
www.ctsa.org

Center for Tropical and Subtropical Aquaculture | University of Hawaii at Manoa 1955 East West Road, Ag. Sci. 216 | Honolulu, HI 96822 US

Unsubscribe | Update Profile | Constant Contact Data Notice

Constant Contact

Try email marketing for free today!