

Letter from the Director

Aloha and Happy Earth Month!

I hope you have enjoyed a great month celebrating our magnificent Earth. Annual Earth Day (April 22) and Month events are joyous occasions for communities to come together to honor the precious and finite natural resources of this wondrous planet. I am happy to see so many entities across multiple sectors of the global economy now using this month as an opportunity to call attention to the ways we interact with the Earth, and to promote the meaningful steps we must take to preserve its resources. I recall a time when few people even knew this annual celebration existed let alone participated; we have come a long way, but there is still much more to do.

Similar to many other organizations in natural resources and regenerative food production fields, CTSA strives to honor Earth and its ecosystems through our daily work. It is our hope that in collectively doing so, we will catalyze changes within our communities to actively participate in creating a healthier environment and more sustainable food systems. Aquaculture presents many opportunities to transform the way we utilize resources to produce food on small to large scales. One of the most prominent examples of this is the development of aquatic feeds using agriculture and fisheries by-products as ingredients. By-products that may typically be considered "waste" can be a valuable source of nutrients for fish, as highlighted in the short CTSA article below. I would also like to point out a wonderful slogan from the 2022 Global Seafood Alliance consumer awareness campaign "Healthy Fish, Healthy Planet, Healthy You!"



Aquaculture is often considered one of the most environmentally friendly methods to produce protein. That being said, we cannot overlook the potential burden on the environment from aquaculture operations, and must consider this in our industry development plans. To this end, the annual CTSA Request for Pre-Proposals (included in this newsletter) lists priority areas that are in line with restorative aquaculture, which is the idea of simultaneously producing food, reducing waste and providing beneficial environmental impacts. These priorities include macroalgae production, aquaculture of extractive / filter feeding species, aquatic feed development, Recirculating Aquaculture Systems (RAS), IMTA, and other innovative technologies. We look forward to reading your proposed ideas for these and the other FY22 priorities. As I regularly express, we must collaborate to reach our shared goals of positively impacting the environment and our food systems, both of which are essential to our survival.

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

CTSA FY22 Request for Pre-Proposals

CTSA is pleased to release the [FY2022 Request for Pre-Proposals](#). The Request lists the top priority areas and species as identified by industry stakeholders in Hawaii and the U.S. Affiliated Pacific Islands, as well as instructions for submitting a pre-proposal by the deadline of 5pm HST on Friday, June 3. As of last year, CTSA is using a standard form for all pre-proposal submissions. Pre-proposal forms can be downloaded on the CTSA website or via request to mbrooks@ctsa.org.

Pre-proposals received by the deadline will be reviewed by

CTSA's Industry Advisory Council (IAC) and Technical Committee (TC). Pre-proposals that receive a majority of votes will move forward with requests for a full proposal.

CTSA's mission is to support aquaculture research, development, demonstration, and extension education in order to enhance viable and profitable aquaculture in the United States. Our main focus is on funding projects that will have immediate, positive impacts on the regional aquaculture industry. FY 2022 Strategic Areas & Priority Species include Innovations in Aquaculture Technology, Finfish Farming Technology, Macroalgae/ Microalgae, Aquatic Animal Health, Hawaiian Fishponds, Aquatic Feed Development, and...[Read More](#)



FY 2022 Request for Pre-Proposals

Regional Research, Demonstration and Extension Projects

Feeds for the Future: CTSA Research that Reduces Waste by Recycling Byproducts

by Meredith Brooks, CTSA Information Specialist

Aquaculture holds much promise to positively impact the food security, economies, and environments of the Pacific Islands. However, the development of commercial aquaculture in the region faces several challenges, one of the most significant being limited access to affordable aquatic feeds. To address this critical bottleneck, CTSA has funded several projects --including some ongoing-- to develop feeds using local ingredients. In recent years, CTSA has sharpened its focus on research that is in line with 'regenerative' aquaculture, which is the idea of simultaneously producing food, reducing waste and providing beneficial environmental impacts; this includes research to convert products that might otherwise be considered 'waste' into usable protein ingredients for aquatic feeds. This type of research aims to increase the capacity for local food production while reducing the amount of organic matter being added into island waste streams.



In the Marshall Islands, the CTSA project "Establishing cost-effectiveness and efficiency of locally produced feeds and Moi farming technology in the Republic of Marshall Islands" has developed and is refining a feed for Pacific threadfin (moi) using local ingredients, primarily bycatch from local commercial fishing operations. The bycatch is mostly considered a waste product and would normally be immediately discarded upon landing; instead, it is being used to create a high quality protein diet for an important regional species. Variations of the feed are still undergoing trials to determine the most effective formulation for local production to reduce reliance on costly imported feeds. Similarly, a CTSA project in American Samoa created a diet consisting of locally-available ingredients such as fishmeal by-product from a tuna canning plant and island starches including banana, taro, and breadfruit.

Under the project "Utilization of Local Agri-processing by-products to Produce Fungal Protein for Aquatic Feed Production," University of Hawaii researchers were able to develop a fungal-based protein ingredient for aquatic feeds using locally available agriculture waste products. The ingredient was tested in feeding trials and results found that it could replace 25% of fishmeal protein without affecting shrimp growth performance. The research group tested various agriculture waste products including molasses, brewer's yeast, and tofu wastewater to determine the best substrate to grow fungal biomass; they found that wastewater from tofu production is an ideal conduit to growing protein-rich biomass. The wastewater contains whey, one of the byproducts of tofu manufacturing that comes out from the curds as it is being pressed. It is estimated that just one local tofu manufacturer in Hawaii produces approximately 100 – 150 gallons of whey every day, which is normally discarded because it is seen to have no practical use. There is much potential for this technology to be applied to the manufacture of local feeds and successfully create a new revenue stream from something that is typically discarded.

Similarly, another recent UH project, "Improving Cost-effectiveness of Producing Local Aquatic Feed from Papaya Fruit Wastes via Innovative Bioprocessing," also produced an aquatic feed ingredient from agriculture by-products that are typically thrown away. Papaya culls, which are available in abundance in Hawaii, were used to culture a protein-rich yeast meal. Researchers established and evaluated a process to repurpose simple, off-the-shelf, fruit processing equipment along with a drying oven and a sieving system to produce papaya juice from whole papaya culls. The juice was used to culture yeast meal from *Yarrowia lipolytica*. The yeast meal was added to experimental diets for hybrid tilapia, and results found that the ingredient can replace up to 25% of fishmeal in an aquatic feed.

These CTSA-funded projects are just a few examples of how agriculture and fisheries by-products that would

normally be considered waste can be converted into usable, nutritious feed ingredients. As we reflect on the many ways that we can improve our utilization of Earth's precious resources, CTSA challenges our stakeholders to look to the future and consider the most effective ways to leverage the need to produce food with the growing amount of underutilized nutrient resources.

Aquaculture Announcements

Website for 2022 National Aquaculture Extension Conference Now Live!

As we have been sharing in recent months, the RAC program is gearing up to support the upcoming National Aquaculture Extension Conference in Maine. The [website](https://seagrant.umaine.edu/extension/national-aquaculture-extension-conference/) for the conference is now open for view: <https://seagrant.umaine.edu/extension/national-aquaculture-extension-conference/>. If you are from the CTSA region and have an interest in attending the conference, please contact CTSA (mbrooks@ctsa.org).

Funding and support for the conference: USDA - Regional Aquaculture Centers USDA - National Institute of Food and Agriculture (NIFA), NOAA, National Sea Grant College Program, Maine Sea Grant, Kentucky State University, University of Maine Cooperative Extension.

New NIFA SBIR Brochure

NIFA has released a brochure to educate the public on the USDA NIFA Small Business Innovative Research program, including the priority areas and examples of recently successful projects. [Click here](#) to download the brochure from the CTSA website.

Registration for Annual Aquaculture Drug Approval Coordination Workshop Now Open

Hosted by the USFWS AADAP Program, the 28th Annual Aquaculture Drug Approval Coordination Workshop will take place in Bozeman, MT from July 25th - 28th, 2022. For those that are unable to join in-person this year, there is an option to tune in to the main portion of the Workshop remotely. This will be a non-interactive option, offered free of charge, and will not include access to side meetings or networking/team building events. Topics to be discussed include aquaculture drug approval research and the progress of associated efforts. [Click here for more information](#), or contact Julie Schroeter with any workshop-related questions (julie_schroeter@fws.gov).

CTSA Project Follow Up: Nurturing the Next Generation

As we celebrate Earth day, we are pleased to share [this video](#) we received earlier this month from a former CTSA-funded researcher. We are happy to find out that the graduate student who worked under the CTSA-funded featherduster project has continued his career and is nurturing the next generation to protect our island biodiversity.

AquaClip: Hawaii's restorative aquaculture opportunities revealed

The State of Hawaii has decided to make a concerted and collaborative effort to raise its visibility in marine aquaculture, in order to capitalise on the commercial opportunities and be at the forefront of innovation in the growing industry. To scope and demonstrate Hawaii's potential in this context, Hatch interviewed a wide panel of stakeholders across the Hawaiian ecosystem and beyond.

It sees shellfish and seaweed aquaculture as having particularly high potential. As forms of restorative aquaculture, these types of food and biomass production require minimal feed, freshwater or land. What's more, restorative aquaculture projects have the potential to go a step beyond impact reduction and can actually improve water quality, remove excess nutrients from their immediate environments, mitigate climate change and provide new habitats – all factors that create healthier ecosystems for marine life, while also providing new opportunities for economic development.

What makes Hawaii well positioned and suited for restorative aquaculture activities?

- A strong cultural foundation – as aquaculture has indigenous roots through the fishpond practices and the islanders have a high rate of seafood consumption.
- Unique geographical advantages and a favourable climate, with high levels of productivity and biosecurity, due to the archipelago's isolated location.
- An existing R&D infrastructure and sophisticated research community.

From 2022 and beyond, the report reveals how the State of Hawaii can set an example in climate change

mitigation, by using restorative aquaculture as a nature-based solution to rejuvenate coastal habitats, indigenous culture and improve food security, while providing more employment opportunities in a sustainable ocean economy...

Source: The Fish Site // [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 2016-38500-25751, 2018-38500-28886, and 2020-38500-32559. 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 University of Hawaii and the Oceanic Institute of Hawaii Pacific University.

Center for Tropical and Subtropical Aquaculture
www.ctsa.org

