

CENTER FOR
TROPICAL AND SUBTROPICAL
AQUACULTURE



Letter from the Director

Aloha,

As you are probably aware, April is Earth month, a time for people across the world to learn about and reflect on the importance of environmental conservation. During this time, I am reminded of the unique opportunities aquaculture has to make an impact in this area. Responsible, sustainable development of the industry, especially in the Pacific Islands, can help to conserve and even replenish populations of aquatic species that are on the brink of collapse due to overfishing.

This month's newsletter is appropriately filled with information pertaining to sustainable aquaculture and conservation. The video in our Island Farmer Spotlight series profiles the Big Island mariculture company Kampachi Farms, a leader in sustainable mariculture. In addition, CTSA's Information Specialist highlights her recently completed outreach and education project (largely based on aquaponics). The newsletter finishes with an article showcasing a prestigious award recently bestowed upon CTSA-funded technology at a social change competition, and this month's AquaClip.

On a final note, I would like to acknowledge those who participated in CTSA's recent survey to assess regional aquaculture priorities. We received over 35 completed surveys from industry stakeholders. The information provided is incredibly valuable to CTSA's future development efforts, and we appreciate everyone's cooperation. Keep your eyes open for more opportunities to participate in the future!

Mahalo,

Cheng-Sheng Lee
Executive Director, CTSA

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Farmer Spotlight Video: Kampachi Farm



Kampachi Farms is an innovative mariculture company based on the Big Island of Hawaii. It was founded in 2011 by Neil Sims and Michael Bullock, former executives of the pioneering Kona Blue Water Farms. Their ongoing research and commercial development in open ocean mariculture technology is industry-leading. [Click here to view the video](#). We hope you enjoy it!

In addition, a short informational video showcasing

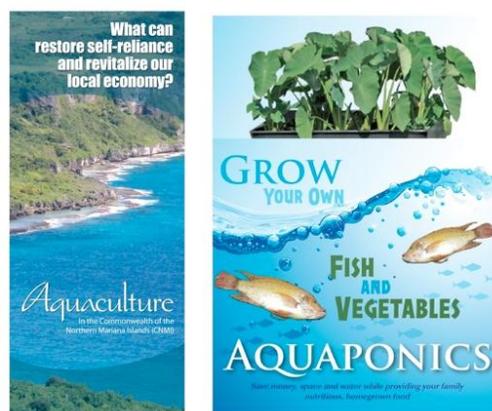
Kampachi Farm's recent project to test open ocean aquaculture in federal waters was recently produced. It is a great tool to pass on to anyone interested in learning more about the project. [Click here to view the Velella Project video.](#)

Aquaculture Outreach and Education in the U.S. Affiliated Pacific Islands

By Meredith Brooks, CTSA information Specialist

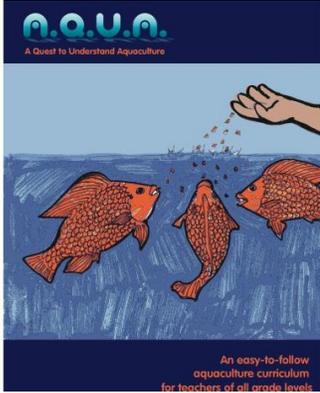
The U.S. Affiliated Pacific Islands hold great potential for aquaculture development. In addition to having an abundance of natural resources, many islands are in need of opportunities to improve local food security, economic growth, and environmental conservation. However, in order for aquaculture to live up to its potential in this region, it must be understood and supported within island communities. Although the practice of aquaculture dates back to ancient China, and was an integral part of the ahupua'a in ancient Hawaii, many people in the Pacific are unfamiliar with modern day aquaculture technologies and capabilities. A concerted education effort is therefore needed to showcase the positive impacts this global industry can have locally. Furthermore, in a region where the average age of a farmer is 50+, efforts must be made to incorporate stimulating, hands-on experiences into K-12 education in order to promote aquaculture-related education and careers to future generations of industry leaders.

With those considerations in mind, my Co-PI's Michael Ogo (Aquaculture Coordinator for the Northern Marianas College CREES program) and Marsha Taylor (teacher at Waiialua High and Intermediate School) and I applied for and were awarded a mini-education grant from NOAA to develop A.Q.U.A. (A Quest to Understand Aquaculture), an aquaculture outreach and education program. The A.Q.U.A. program aims to share aquaculture information and resources with the general public, as well as K-12 educators and students, in Hawaii and the Commonwealth of the Northern Mariana Islands (CNMI). It was developed over the course of the project year, and will continue to be managed by CTSA. The two main informational tools of the program are a website and curriculum (discussed later in detail).



AQUA brochures promoting aquaculture in the Pacific region.

The first task in the development of the program was to perform an informal assessment of public knowledge and opinions about aquaculture. To do so, we conducted an online and in-person survey. 47% of respondents indicated that they know only basic information about aquaculture, while 13% indicated they do not know what aquaculture is. 53% of respondents stated their general opinion of aquaculture is that it is "good," while 30% indicated they "do not know" how they feel about it. For the most part, those who indicated concern with the industry cited negative environmental impacts farming may have. Based on survey results and subsequent meetings with prominent industry stakeholders, key outreach messages and corresponding materials were developed.



Top: AQUA website homepage
Bottom: Cover of AQUA curriculum

Outreach messages were distributed in the form of press releases to media outlets in both Hawaii and the CNMI. One Oahu media outlet, The North Shore News, featured three separate stories on the project, and the Saipan Tribune featured two articles about aquaculture. AQUA was also featured on a KGMB news broadcast about an Earth Day event we participated in. Outreach materials, including brochures and posters profiling various aspects of aquaculture in the Pacific region, were distributed to the public at multiple events in Hawaii and the CNMI. The project work group participated in several environmental awareness events in Hawaii, in addition to presenting to small groups and organizations, including Oahu Rotary Clubs. The project also held three events in December 2011 (one at Waiialua HIS and two at Rota schools) to promote the project to community residents.

In addition to in-person outreach, a new website was developed specifically for the project. The website www.PacificAQUA.org, is filled with engaging information on aquaculture and the AQUA project. Sections include "History of Aquaculture," "Aquaculture & the Environment," "Seafood & Your Health," and "Get Involved," just to name a few. It also contains several links to regional

aquaculture entities, projects, and resources. Since the website will continue to be managed by CTSA and content will continually be updated, we are hopeful that it will be an effective tool in teaching the public about aquaculture.

Significant efforts were also dedicated to improving aquaculture education resources for K-12 educators and students in the Pacific region. An informal curriculum was written, and beautifully illustrated with a Pacific Island theme by a local artist. The 50+ page curriculum contains a plethora of basic information about aquaculture, with an emphasis on sustainable practices. The information is presented in Central Concepts, activity ideas, and worksheets in five sections; 1) Introduction to Aquaculture; 2) The Business of Aquaculture; 3) Aquaculture in Practice; 4) History of Aquaculture; and 5) Aquaculture & Human Nutrition. The full document is available for download on the AQUA website.



In addition to the curriculum, the project work group established five aquaponics systems at local schools (two schools in Hawaii and a school in Rota). Waialua High and Intermediate School students, along with CTAHR Aquaculture Extension Agent Dr. Kai Fox, project Co-PI Marsha Taylor, Waialua teacher Vikki Pescaia, and I setup a hybrid ebb-and-flow/raft aquaponics system at their school in February. The system was stocked with approximately 300 tilapia fry, donated by an Oahu farmer. To date, the students have experienced a very small amount of fish mortalities and have been able to harvest their vegetables several times. Students are tracking water quality, fish weight and feeding data, and conducting their own growth experiments. Since the inception of the project, Waialua HIS has expressed interest in utilizing a large agriculture field they have to expand their system. Another system was set-up and is being used as an educational tool in the Waialua Elementary School 4-6 grade "Agriculture Academy," led by teacher Paul Burnett.

Top: Waialua HIS students building their system
Bottom: Rota students learning about the nitrogen cycle

Co-PI Michael Ogo was able to successfully setup three different systems at the newly combined Rota middle and high school. One system is based on the CTSA-funded NFT aquaponics technology, and the other two are hybrid ebb-and-flow/raft (similar to the Waialua schools). Fish are stocked in all three systems, vegetables are planted, and both middle and high school students have successfully completed two harvests. They are using the three systems to conduct experiments comparing the different designs of aquaponics systems.

Although the pilot project to develop the program has come to a close, my Co-Pi's and I will continue to promote and disseminate the ideas and materials associated with A.Q.U.A.. We are happy that we were able to create several unique materials that will hopefully aid in the development of our regional industry. Last but not least, we are incredibly thankful to those who helped us along the way, including the researchers at CTAHR and Oceanic Institute. I will keep you informed of the progression of the program, but in the meantime, please contact mbrooks@oceanicinstitute.org for more information.

Pacific Island Spotlight: Aquaponics System Designed for Remote Pacific Islands Wins Prestigious Award

The aquaponics system designed under the CTSA project "Adapting aquaponics systems for use in the American Pacific Islands" has received recognition at a prestigious international competition. The system design, conceived by Dr. Harry Ako of UH-CTAHR, along with additional research conducted in American Samoa by student Kiara Sakamoto (under CTSA funding), served as the basis for a conceptual project titled "Ho'oulu Pacific." The project seeks to increase the self-sufficiency and health of Pacific Islanders through aquaponics. Collaborator David Walfish presented the project in the "Pitch for Change" competition at the Harvard Business School/Harvard Kennedy School's 13th annual Social Enterprise Conference. "Ho'oulu Pacific" won the competition, beating over 80 international teams from distinguished institutions including Wharton, Cambridge, Fletcher, MIT Sloan, and Harvard.

Dr. Ako's system considers the exact nutrient requirements of both fish (tilapia) and vegetables, thereby maximizing production and cost efficiency. According to Mr. Walfish, "it was beneficial for us to propose a system that has been studied and measured scientifically. Potential funding agencies have more faith in the projected output levels because they are backed up by data."

The system also comes with an economic model adapted from work by Dr. Ako and the agriculture economist and CTSA-sponsored researcher Dr. PingSun Leung. The low-cost, mechanically simple system was originally designed with the remote Pacific Islands in mind, and can be adapted to both rural and urban communities across the world. Several systems have already been successfully established in Hawaii and American Samoa with funding support from CTSA.

Over 1,500 representatives from international social change organizations observed the presentation at the conference, and many have since expressed interest in the technology. The project work group is pursuing additional funding opportunities and hopes to get the project off the ground shortly. To learn more about the contest, visit <http://socialenterpriseconference.org/2012pitch-for-change/>

AquaClip: Updating Hawaii's Ocean Resources Management Plan

Posted on www.hawaii247.com, April 19, 2012.

The Hawaii Ocean Resources Management Plan (ORMP) sets forth guiding principles and recommendations for the state to achieve comprehensive and integrated ocean and coastal resources management.

Section 205A-62, Hawaii Revised Statutes, charges the Office of Planning, Coastal Zone Management (CZM) Program, with the review and periodic update of the ORMP, as well as coordination of overall implementation of the plan.

The ORMP was last updated in December of 2006, and takes a place-based approach to management of ocean resources in the islands, based on recognition of the ecological connections between the land and sea, the link between human activities and its impacts on the environment, and the need for improved collaboration and stewardship in natural resources governance.

Previous versions of this plan go back to 1985, however, the 2006 ORMP builds on traditional Hawaiian management principles and lessons from past efforts, promoting a shift toward integrated and area-based approaches to natural and cultural resources management that require greater collaboration among jurisdictional authorities and that will catalyze community involvement and stewardship...

Public listening sessions are planned on the islands of Kauai, Oahu, Maui, Molokai, Lanai, and on both the east and west sides of Hawaii Island...

[Click here to read the full article.](#)

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 2007-38500-18471, 2008-38500-19435, and 2010-38500-20948. 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 and the University of Hawaii.