

Letter from the Director

Aloha!

CTSA is happy to announce that we will be hosting our 2nd annual Progress Report to the Public later this month. This is a great opportunity for our researchers to present their latest findings, and for the public to learn about CTSA and its funding process; I hope you will attend. Please see the full article below for the details.

I would like to thank those of you who participated in the NOAA listening sessions and provided your input on the aquaculture policy. For those of you who have not yet submitted your comments to NOAA, there is still time do so. Please see the article about the Honolulu meeting below for more information.

Also in this issue of *Regional e-Notes*, we are introducing a new section: Pacific Island Spotlight. This monthly section will feature relevant news and updates from CTSA funded projects in the outer Pacific islands. The first Spotlight is on Shrimp Health Management in Guam and CNMI.

If you have any suggestions, concerns, or comments, please do not hesitate to let us know.

Mahalo,

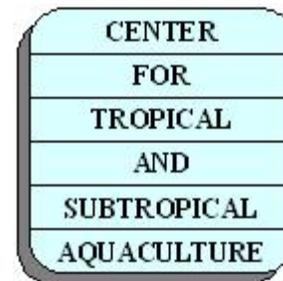
Cheng-Sheng Lee
Executive Director, CTSA

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CTSA Progress Report to the Public - May 28

On May 28th, the Center for Tropical and Subtropical Aquaculture will host its 2nd annual "Progress Report to the Public." At this event, CTSA funded researchers will present their findings from the last year. The following projects will be presented at this year's meeting:

"Bioprocessing of Pacific Island Byproducts for the Production of Value-added Feed Ingredients," presented by Dr. Warren Dominy

"Kahala Broodstock Management," presented by Dr. Charles Laidley

"Determining Aquaculture Bottlenecks of Pacific Threadfin (*Polydactylus sexfilis*): Increasing Fry Survival, Growth, and Quality, Year 1," presented by Dr. Charles Laidley

"Improving the Hatchery Output of the Hawaiian Pink Snapper (*Pristipomoides filamentosus*), Year 1," presented by Dr. Clyde Tamaru

"Improving Outputs in Commercial-Scale Production of Swordtails in Hawaii," presented by Dr. Clyde Tamaru

"Development of DNA Markers for Pacific Threadfin Aquaculture," presented by Dr. Jinzeng Yang

"Adapting Aquaponics Systems for Use in the American Pacific Islands," presented by Adam Baker

"Pacific Regional Aquaculture Information Service for Education (PRAISE), Year 3," presented by Kris Anderson

In addition to the project presentations, the Center will present information on the future direction of funding.

Please come and join us for this informational event at the Oceanic Institute's ITTF Building (directly across the street from the Makai Research Pier). The event will take place from 9am - 12:30pm, and refreshments will be provided. We ask that you please RSVP to this event by May 21 so we can plan accordingly. To RSVP, please email Meredith Brooks at mbrooks@oceanicinstitute.org, or if you are a member of AquacultureHub.org, you can RSVP on the [event page](#).

Visions of a Bright Future for Aquaculture in the Pacific

NOAA Honolulu Listening Session Highlights
by Meredith Brooks, CTSA

On April 27, 2010, NOAA held the fifth in a series of seven listening sessions at the Ala Moana Hotel in Honolulu. The NOAA aquaculture listening sessions and national call-in are an open forum for the public to make recommendations to NOAA officials regarding a new policy that will address all forms of marine aquaculture.

The Honolulu session began with a presentation by Dr. Jo-Ann Leong, HIMB Executive Director and Chairman of the CTSA Board of Directors, titled "Challenges and Opportunities for Aquaculture in Hawaii." In her presentation, Dr. Leong gave an overview of the current status of aquaculture in Hawaii, citing that Hawaii consumes an average of 50 million pounds per year of seafood, yet only captures 33 million pounds and produces less than one million pounds from aquaculture, requiring the remaining 16.5 million pounds to be imported. Dr. Leong also discussed the important role aquaculture can play in the success of the "Hawaii 2050 Sustainability Plan", reiterating that a currently un-sustainable Hawaii would run out of perishable food in seven days if there were to be a disruption to shipping due to a natural disaster or other means. Better Management Practices for disease, the use of more polyculture systems, and alternative feed development were just some of the solutions Dr. Leong provided to problems facing the aquaculture industry.

Dr. Leong followed her presentation by reading a letter from Senator Dan Inouye. In his letter, Senator Inouye stressed that the key to developing the best aquaculture policy is balance; we need to provide safe, reliable sources of food while at the same time minimizing our impact on the environment. Senator Inouye expressed his belief that with strong science and thoughtful regulation, aquaculture can help to solve our sustainability problem. He cited that Hawaii should set an example for the rest of the country, as the state is home to fishponds, the oldest tradition of aquaculture in the United States.

With an estimated attendance of around 100 scientists, educators, and activists, the Honolulu session garnered a total of 28 speakers. While speakers ranged in their sentiments towards aquaculture practices, they all agreed that action must be taken to make local and national seafood more sustainable.

Todd Lowe, Program Manager of the Aquaculture Development Program (ADP), stressed what Dr. Leong discussed about the vulnerability of Hawaii to natural disasters, and cited a recent salmonella outbreak in imported ahi on Oahu as an example of the importance of growing food locally. Norman Nam, the owner of the Kailua restaurant Cinnamon's, expressed his frustration over the inability of many local restaurants to offer fresh fish as a permanent menu item. He stated that he can currently only offer one local fish, and would like to be able to offer more to his customers, who regularly inquire about fresh fish. Chef Ronnie Nasuti from Roy's Restaurant expressed the same

sentiment, and cited the open-ocean aquaculture operation Hukilau Foods as a primary supplier of fresh fish.

Several speakers directed their comments specifically at open-ocean aquaculture. Speaker Todd Hendricks, a retired marine science teacher, stated that feeding of fish in open ocean cages increases the nutrients in the area directly surrounding the cage, citing that the current operations on Oahu have helped to reestablish populations of other locally-important fish. Ron Weidenbach, President of the HAAA, discussed the importance of expanding aquaculture both on and offshore, given the limited amount of opportunities to increase coastal aquaculture.

Members of the activist group Pono Aquaculture Alliance stressed the importance of involving the community and integrating Hawaiian culture in aquaculture policy decisions, mostly citing fishponds as their preferred direction for the local aquaculture industry. Dr. Neil Frazer of the Alliance outlined some of their specific criteria for *pono aquaculture, including natural disease control (no antibiotics), the use of only locally produced feeds, the use of polyculture and aquaponics systems, culture of more herbivores, and community buy-in.

After the listening sessions are complete, NOAA will analyze the public input and develop a draft national policy for review and public comment. Once that process is complete, the agency will issue the new NOAA aquaculture policy. NOAA's goal is to issue a new national policy that will enable sustainable marine aquaculture within the context of the agency's multiple ocean stewardship missions and broader social and economic goals.

If you have not already done so, you still have until May 28 to leave your comment. To do so, please visit the following website:

<http://www.nmfs.noaa.gov/aquaculture/policy1/comments.htm>

**Pono" is defined as "proper" in the Alliance's Statement of Unity.

Pacific Island Spotlight: Shrimp Health Management

"Current Status and Initiatives in Enhancing the Biosecurity Measures in Guam and CNMI"

by Hui Gong, Ph.D.

Introduction

Prevention is considered to be the crucial element in the health management of shrimp operations against the intrusion and dissemination of the various infectious shrimp pathogens, which could effectively block the occurrence of catastrophic disease outbreak. Consequently, the application of biosecurity in any shrimp aquaculture entity should be the cornerstone of its integrated health management. Even though the implementation of biosecurity measures could be manifested at different levels, from farm, regional, national up to the international level, it would be most fundamental that the biosecurity principles/risks be properly addressed for each individual facility, and necessary steps be taken in order to maintain and improve the health status of shrimp stock for its units, as well as to contribute to the regional health status.

Isolated in Western Pacific, yet within four hour flight time to major cities in Asia, where the center of world shrimp aquaculture production is located, the Mariana Islands have a unique geographic advantage and great potential in playing a more significant role in shrimp aquaculture locally, regionally and even globally. In addition to the steadily growing consumer's needs of the local shrimp meat production, there is increasing demands of specific pathogen free shrimp broodstocks from the Asian countries.

Driven by the strong demand for healthy and high quality shrimp both regionally and locally, the shrimp farming industry on Guam and Commonwealth of the Northern Mariana Islands (CNMI) has been growing rapidly in the past few years and will continue this trend steadily in the foreseeable future. With Pacific white shrimp (*Penaeus vannamei*) as the sole penaeid species cultured in Guam and CNMI, the current capacity of the shrimp industry produces about 45 metric tons for shrimp meat consumption, and additionally supports over one million dollars worth of broodstock export on annual basis. There are about seven or eight shrimp operations with various sizes in the

region, requiring about five million shrimp postlarvae annually to stock at the current operational scale.

Current status of shrimp health management

Evaluation

Despite the multiple advantages favoring shrimp aquaculture development in the region, the concept of biosecurity is vague and the practice is sporadic. The whole region is lacking health monitoring and regulatory control programs. In the past, there weren't biosecurity audits or similar efforts to collect information across all of the shrimp farms in the region and evaluate the current health status of the overall shrimp facilities in the region. There is a great need to increase the awareness of biosecurity measures at the farm level, as well as to establish systematic health management to protect the whole region from the introduction of viral pathogens and avoid the major disease outbreak, to reinforce the clean zone image of the region, eventually leading to long-term sustainable shrimp aquaculture development on Guam and CNMI.

Actions taken: Conducting the biosecurity audits

Funded by CTSA under USDA NIFA Grant 2007-38500-18471, University of Guam (UOG) took the initiative in conducting the biosecurity audits for the seven existing shrimp facilities (which are in operation at the time of biosecurity audits being conducted) across the region, four of which are in Guam, two are in Saipan, and one in Tinian. In addition, shrimp samples were collected on site and then submitted to the University of Arizona for diagnosis.

A site-specific executive report was generated for each individual facility. A brief summary of key components in biosecurity is listed in Table 1.

Facility	Location	Water treatment	Seed source	Personnel/ visitor	Diagnostic results of the pathogens for SPF stocks	Facility Impact
#1	Coastal	No	Asia	Some restriction	One pooled sample weak positive IHNV by PCR, but not by histopathology	Medium
#2	Coastal	No	Asia	Some restriction	Not detected	Medium
#3	Coastal	No	Asia	Little restriction	IHNV positive by both PCR and histopathology	Medium
#4	Inland	No	UOG	Some restriction	Not detected	Medium
#5	Inland	No	UOG	Little restriction	Not detected	Low
#6	Inland	Gravel filtration	Asia	Highly restricted	Not detected	High
#7	Coastal	Gravel filtration	UOG	Highly restricted	Not detected	Very strong

In addition, based on the information gathered from the initial round of the biosecurity audits, key risk factors were identified for the site specific facility and recommendation was also outlined for improvement. Overall, the greatest risk for some facilities is the seed sources imported from Asian countries, and no proper quarantine procedure is in place to minimize such risk. Fortunately, there has not been any major shrimp disease outbreak in the region in the past decade, although there are indications of the presence of IHNV in a couple of locations. If such health issues are not scrutinized and proper solutions are not sought at both the facility and regional levels, the adverse effects may magnify and could evolve to a much more serious situation.

Setting up health surveillance for two facilities

Based on the geographic location and the levels of impact of the facilities on the aquaculture development in the region, two facilities were selected for health surveillance: one is in Guam and one is in Saipan. Sampling schemes have been tailored to fit the sources and numbers of shrimp stock in the facility. On-site training for sampling the shrimp tissues for specific diagnostics was also provided during the health surveillance visit.



Fig. 2 On-site training of taking shrimp sampling in the selected facilities during the health surveillance visits.

Publication (technical paper)

A comprehensive report is processed to document the current health status of shrimp aquaculture in the Mariana Islands region and identify the key biosecurity risk factors after careful examination, and prioritize the issues for improving industry-wide biosecurity measures in the region. Distribution of this publication to the aquaculture stakeholders and corresponding government agency, such as territorial veterinarian's office, etc., will be followed. And if needed, meetings will be set up to provide more information and further assistance.

Future outlook and direction

Information generated from this health project fills up the blank of baseline information of health status of shrimp farming in Guam and CNMI. In addition, the project also serves as a useful tool in increasing the biosecurity awareness among the regional shrimp aquaculture society and improving the health management of shrimp aquaculture in Guam and CNMI.

In the end, the establishment of a systematic health management require the collaborative efforts from all the stakeholders in order to improve the health status of the regional shrimp aquaculture and eventually lead to long-term sustainable shrimp aquaculture development in Guam and CNMI.

May AquaClip - Kona Blue Water Farms Gets Federal Grant

Source: *Pacific Business News*, May 7 2010.

Kona Blue Water Farms Inc. on the Big Island has won a \$242,889 Saltonstall-Kennedy grant from the National Marine Fisheries Service to research alternative protein sources for aquaculture feeds.

The project examines protein sources as a substitute for fish meal in the diets of Kona Kampachi, the company's brand of farm-raised Hawaiian yellowtail.

The three protein sources include: microalgal by-products from biofuels production; a single-cell protein made from food processing water; and, a fish protein filtered from the wastewater of fish processing plants.

"This research addresses the fundamental challenge of developing marine fish diets that are both scalable, and sustainable," said company co-founder Neil Anthony Sims.

The marine fish hatchery and aquaculture operation, founded in 2001 in Kailua-Kona, will substitute protein sources at different ratios into the Hawaiian yellowtail diet, comparing growth rates, food conversion ratios and product quality to that of fish fed a standard commercial diet.

The research is expected to begin in July.

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 2005-38500-15720, 2006-38500-16901, 2007-38500-18471, and 2008-38500-19435. 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.

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