

CENTER FOR
TROPICAL AND SUBTROPICAL
AQUACULTURE



Letter from the Director

Aloha,

As you may have heard the sad news, Dr. Jeff Barcinas of Guam recently passed away. Dr. Barcinas served on the CTSA Board of Directors from 1994-2003, and was a valuable contributor to our development in the Pacific.



During his tenure at the University of Guam, Dr. Barcinas wore many hats. From 1995-2003, he was the Dean of the College of Agriculture and Life Sciences. From 2003-2008, while serving as the Director of the Cooperative Extension Service, he was also the Vice President of University and Community engagement.

On behalf of CTSA, I would like to express condolences for his loved ones and our deepest appreciation for his many contributions to his community, the University of Guam, and CTSA.

Mahalo,

Cheng-Sheng Lee
Executive Director, CTSA

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Island Farmer Spotlight Video: Big Island Abalone



Big Island Abalone produces Kona Coast Abalone™ out of their Natural Energy Laboratory of Hawaii

Authority (NELHA) facility. [Click here](#) or on the picture above to watch a short video and learn more about their operation!

Biosecurity Project Update from the Oceanic Institute

CTSA Aquaculture Biosecurity for Hawaii and the Pacific Region

Charles W. Laidley and Eric Martinson

Oceanic Institute, Finfish Department, 41-202 Kalanianaʻole Hwy, Waimanalo, Hawaii 96795

With global expansion of the aquaculture sector comes increasing concern over disease issues with a range of viral, bacterial and parasitic diseases costing aquafarmers billions of dollars per year in lost production. For example, current shrimp aquaculture appears predominantly affected by viral pathogens, leading to the development of specific (viral) pathogen-free technologies with movement of operations in-land away from coastal waters. The marine finfish sector, is affected globally by a wide array of viral, bacterial and ectoparasitic pathogens. However, in stark contrast with the shrimp sector, hatcheries are currently tied to coastal locations, and marine finfish growout operations are moving into the offshore and open ocean environments yielding significant biosecurity challenges. With local microalgae production now representing 56% of the estimated \$30 million in 2010 aquaculture output in Hawaii, and poised to expand rapidly with the recent renewal of interest in algae biofuels, this sector is often overlooked when considering review of biosecurity programs. Similarly, the ornamental fish and invertebrate trade with its large volume of imports and exports is likely to test even the most stringent biosecurity procedures. And finally, recent growth of interest in aquaponics and other forms of multitrophic aquaculture is leading to a rapid spread of small-scale commercial and hobby operations with active trade of many strains and species of both plants and animals.

Gaining a better understanding of present-day aquaculture and biosecurity practices is an important first step in developing and improving operational biosecurity across the. Biosecurity is a suite of procedures that protect living organisms from contracting, carrying, and spreading pathogens and other non-desirable organisms. It is classically divided into a series of functional steps starting with hazard identification (i.e., the identification of all known or identifiable pathogens in a particular species or region) and risk assessment examines the risk of introduction and the risk of establishment of these hazards. Therefore, the first activity under this project is the development of a "survey plan" specifically tailored for the examination and review of present day biosecurity concerns and practices (i.e., risk analysis) for the key players in Hawaii aquatic plant and animal-related industries. The types of operations in the aquatic animal and plant sectors in Hawaii is quite diverse.

Table 1. Examples of some of the main diseases of relevance to the Hawaii aquaculture industry.

Aquaculture sector	Common disease issues
algae production	viral – pathogens thought to play critical ecological role, little info on effects to cultured algae bacterial – range of reported bacteria often associated with unhealthy cultures other – contamination of cultures with amoeba, ciliate, fungi and other algae species have been the main concerns to date
marine fishes	viral – increasing concern over VHS (<i>rabdovirus</i>), VNN (<i>nodavirus</i>), <i>lymncystis</i> and other <i>iridoviruses</i> common to other regions bacterial – common suite of mainly opportunistic marine bacteria includes <i>Vibrio</i> , <i>Aeromonas</i> , <i>Pseudomonas</i> , <i>Flexibacter</i> , etc. other – ectoparasites such as <i>Amyloodinium</i> , <i>Cryptocaryon</i> and <i>Neobenedenia</i> have been the main challenge to marine fish culture
Freshwater fishes	viral – increasing concern over VHS, IHNV, KHV and other viruses common to other regions bacterial – range of opportunistic freshwater bacteria including <i>Aeromonas</i> , <i>Vibrio</i> , <i>Flavobacteria</i> . other – protozoan parasites (<i>Ichthyophthirius</i> , <i>Trichodina</i> , <i>Dactylosyrus</i> & <i>Gyrodactylus</i>), <i>Saprolegnia</i> and other fungi
Molluscs	viral – <i>iridovirus</i> <i>Akoya</i> oyster virus, oyster herpes virus, abalone viral disease bacterial – <i>Vibrio</i> , <i>Pseudomonas</i> , <i>Aeromonas</i> , Juvenile oyster disease, <i>Nocardiosis</i> , hinge-ligament disease, withering syndrome other – protozoan parasites (<i>Perkinsus</i> , MSX disease), <i>Sabellid</i> worms, <i>haplosporidium</i> , ciliates, <i>tubellariums</i> , <i>trematodes</i> , <i>cestodes</i>
Crustaceans	viral – a broad range of viruses including TSV, WSD, YHD, IHHN, IMN, etc. are the main challenge to shrimp culture bacterial – necrotizing <i>hepatopancreatitis</i> other – fungal disease

A preliminary list of disease organisms previously identified in Hawaii or found to be health risks (i.e., hazards) for the major groups of aquatic species cultured in Hawaii is shown in Table 1. Surveys of industry stakeholders over the next few months will help us further refine the list assess

the likelihood for exposure, and exposure consequences. During these surveys, we are reviewing existing practices, policies and procedures used on-farm and in the region to reduce risks of pathogen introduction, spread and susceptibility. These assessments will examine a broad range of parameters including import, collection and disposal of organisms; quarantine and preventative treatment/vaccination procedures; water source, treatment, quality monitoring, and disposal; cleaning and disinfection protocols; prophylactic and therapeutic treatments; record-keeping; and other aspects of animal health monitoring and expertise.

The collected survey data will then form the basis of a risk assessment for aquaculture operations in the region. We will continue to refine the survey plan while conducting the assessments and later, make it available as a tool for individual stakeholder to conduct their own operational assessments. The purpose of the risk assessment is to develop a comprehensive review/overview of existing biosecurity concerns and practices for use in developing best management strategies and practices for the region.

The long-term goal will be to develop a comprehensive biosecurity program for the region which offers a broad, comprehensive strategy to build and enhance capacity for the management of aquatic organism health. The final product of this project is a comprehensive report reviewing operational biosecurity in Hawaii and the Pacific Region. The report will include an (1) updated background review of aquaculture biosecurity of relevance to Hawaii, (2) provide instructions and a survey plan developed for use by farmers and other industry stakeholders to conduct their own biosecurity reviews, (3) analyze specific regional, and (4) culture species specific biosecurity issues identified from the comprehensive assessments, and (5) develop best management guidelines for aquaculture operations in Hawaii and the Pacific Islands. Biosecurity workshops to be convened at the end of this to review project findings with stakeholders in the aquatic animal health sector including policy makers, regulators, scientists and farmers.

CTAHR/HAAA Workshop Synopsis



The CTAHR Workshop/HAAA Annual Board Meeting, co-sponsored by CTSA, was held at the Windward Community College on Saturday, November 12. It was an informative gathering of researchers, farmers, and aquaculture industry stakeholders. Representatives from seven CTSA funded projects presented updates to the audience of about 100 attendees.

[Click here](#) to view a synopsis of the meeting and access the presentations.

AquaClip: US Diners Still Wary of Farmed Fish?

By Christine Blank, November 27, 2011. www.SeafoodSource.com

A recent survey shows that some consumers are still concerned about eating farmed fish. At the same time, they are willing to pay a little more for sustainable food and seafood when they eat out.

In a recent Mintel survey of more than 1,900 U.S. restaurant patrons, only 25 percent of consumers

believe that farmed fish is the same quality as wild fish. In addition, only 33 percent agree with the statement: "farmed fish is as safe as wild fish." Mintel executives do not know why consumers have a lower quality and safety perception of farmed versus wild fish.

However, the Mintel report also found out that 57 percent of consumers are willing to pay more for local and sustainable food.

"There is a willingness to pay more for local and sustainable, because there is a higher quality perception. With sustainability, you are also paying it forward a bit. We may not be able to pay a lot more for our energy usage, but we can support those companies that fit with our ideals a little more easily," said Eric Giandelone, director of research for Mintel Foodservice in Chicago.

[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.