



*Regional  
e-Notes*

## Letter from the Director

Aloha!

At CTSA, we are always looking for ways to facilitate the sustainable development of aquaculture in the Pacific Islands. Aquaculture has the potential to help mitigate some of the greatest challenges facing our Islands' people and environments, including a growing food crisis and a changing climate. However, we believe that a big part of the industry's advancement starts with consumer support.

Earlier this month, we participated in our first ever "Earth Month" event at the Waikiki Aquarium, where we reached out to over 3,000 of Hawaii's adults and children. It was exciting to see members of the general public engrossed in conversations about aquaculture, and we look forward to participating in similar events in the future.

An article highlighting the event is included in this month's issue, in addition to two aquaculture workshop/seminar announcements and a new video from the CTSA Publications project about the Micronesian Pearl Industry.

Last but not least, I would like to thank those of you who submitted a Pre-Proposal for our FY2011 funding cycle. We look forward to the selection process once again!

Mahalo,

Cheng-Sheng Lee  
Executive Director, CTSA

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[www.ctsa.org](http://www.ctsa.org)  
[www.oceanicinstitute.org](http://www.oceanicinstitute.org)



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## CTSA Celebrates Earth Month at "Mauka to Makai Environmental Expo"

Do you eat seafood? Do you know that over 85% of the seafood we eat in Hawaii is imported? Do you know there is a way we can grow fresh, local, sustainable seafood?

These are just a few of the questions/topics CTSA staff members and sponsored researchers discussed with the general public at the "Mauka to Makai Environmental Expo," held in honor of Earth Month. At the expo, representatives at the CTSA booth handed out materials, answered questions about aquaculture, and made Gyotaku fish prints with excited kids of all ages. The purpose of the freecommunity event, hosted by the



The CTSA booth was popular with event participants of all ages

Waikiki Aquarium on April 9th, was to increase public awareness of issues concerning the environment, particularly clean water and the importance of its conservation. The theme "E Malama I Ka Wai Ola ~ Protect Our Waters For Life" was evident at nearly every booth, including CTSA's.

A demonstration aquaponics system was plugged in next to the CTSA booth so interested expo attendees could get a visual of the water-saving food production technology. The fact that the system uses only 4% of the amount of water that traditional agriculture uses (and produces fish in addition to vegetables) caused many to consider constructing their own, and even resulted in a few queries about establishing commercial farms.

In addition to an aquaponics flyer, CTSA handed out brochures on the Regional Aquaculture Center program and the Oceanic Institute, Hawaii Seafood posters, and a fact sheet dispelling some common myths about aquaculture. Our booth staff discussed the role of aquaculture in the environment with attendees, and provided data and information on open ocean mariculture, sustainable aquatic feeds, and restocking programs.

Discussion of restocking programs led directly to one of the highlight activities of the expo: the release of aquacultured moi from the Oceanic Institute. The aquarium organized for local school children to release the fish into the ocean directly behind the aquarium. Groups of two students at a time carried large orange buckets into the water and tipped them out to release the juvenile moi. "The fish are so little, and now they can grow big on the reef," exclaimed seven year old Kevin from Sunset Beach elementary school. "We have to be careful and not take so many fish from the reef, especially small ones."



Two young boys carry a bucket of Oceanic Institute moi to the shore behind the Waikiki Aquarium. This release was part of the aquarium restocking program.

Most children who came to the event, including Kevin, stopped by our booth to paint a tilapia and transfer their artwork to paper they could take home and hang on the fridge (also known as Gyo-taku fish printing). While they worked on their designs, CTSA representatives shared fishy-facts with them and conversed with their parents about the aquaculture industry.

"My kids are having a great time painting fish and doing other activities", stated event participant Jenifer Kanben. "I am learning about things I didn't know before. It seems like aquaculture can really help to ease the overfishing problems we have in our ocean. I want to learn more about it."

CTSA's participation in this event was instigated and partially supported by the AQUA (A Quest to Understand Aquaculture) public outreach and education project. The project is run by the Center and funded by a NOAA grant. A dedicated website for the project is currently under construction and will be introduced in a future issue of e-notes.

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*CTSA would like to extend a warm mahalo to CTAHR for loaning us the aquaponics demonstration system.*

## It's All About Water! Upcoming Aquaculture Events in Hawaii

### **Water Quality Workshop on Maui**

On Saturday, May 21, the College of Tropical Agriculture and Human Resources (CTAHR) and the Sea Grant College Aquaculture Extension program will hold a workshop on Basic Water Quality Testing for Aquaponic Systems. The workshop, which is a part of the CTSA project "Diversifying Freshwater Aquaculture Products for Hawaii: Two Crossover Species, the Red and Black Pacu," will be held at UH-Maui College (Agriculture Building, Room 104) from 10am - 2pm. The cost is \$30 per person.

After completing this workshop, a participant will...

- Know what total nitrate-nitrogen is and how and why it is measured.
- Have a basic understanding of the nitrogen cycle in an aquatic setting.
- Know what water chemistry parameters are important to measure.
- Know what pH is and why and how it is measured.
- Have an understanding of how to make an informed decision as to what method to use/purchase to measure the water chemistry parameters.

In addition to the workshop activities, participants are encouraged to bring their own water sample and have it tested using the various methods that will be available at the workshop. Participants can also bring their own test kits if they already are using them to compare against other kits and methods that will be available at the workshop.

The workshop is limited to 20 participants because of the size of the classroom. Pre-registration is on a first come first serve basis and pre-payment will be required to participate in the workshop. Additional workshops following the same format will be held depending on demand.

To make a reservation please contact: Robert Howerton at 268-3246 or [howerton@hawaii.edu](mailto:howerton@hawaii.edu)

Payment is by check, money order or cash only. Make checks or money order payable to RCUH and send payment to: Department of Molecular Biosciences and Bioengineering, University of Hawaii-Manoa, 1955 East-West Road, Ag. Science 218, Honolulu, HI 96822.

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### **Special Seminar: Sustainability and Climate Change Series**

On Wednesday, May 4, special guest speaker Kartik Chandran (Associate Professor and Director of CUBES Program at Columbia University) will visit the University of Hawaii at Manoa to present his research on "Nitrogen Transformations in Water/Wastewater and Climate Change." The seminar is being hosted by the Department of Molecular Biosciences and Bioengineering and will take place from 10:30-11:30am in the Agriculture Science building, Room 219.

#### **Abstract**

Biological Nitrogen Removal (BNR) strategies could be a significant contributor to atmospheric N<sub>2</sub>O

and NO depending upon the bioreactor configurations and operating conditions. In the future, as BNR is implemented at wastewater treatment plants around the nation, the flux of these gases to the atmosphere could significantly increase. We are leading the first nationwide study on the quantification of the N<sub>2</sub>O and NO emissions inventory at several wastewater treatment facilities. Under the purview of this project, we have developed and implemented as a first crucial step, a detailed protocol for determining the N<sub>2</sub>O and NO emissions fluxes from waste treatment facility. Additionally, we have developed a molecular level elucidation of specific triggers and pathways for biogenic N<sub>2</sub>O and NO production by nitrifying bacteria, which have thus far been ignored as contributors to these gaseous compounds in BNR processes. The biological nitrogen transformations discussed are equally important in aquaculture and hydroponic systems, and coastal water bodies. Our studies can be extended to examine the role of aquaponic systems in global climate change.

More details on Dr. Chandran's work can be found at [www.columbia.edu/~kc2288](http://www.columbia.edu/~kc2288).

## Farmer & Pacific Island Spotlight: A Sustainable Industry for Micronesia



Last December, CTSA's Information Specialist traveled to Pohnpei to meet with Dr. Masahiro Ito and the talented team of local technicians behind the CTSA "Black Pearl" project in the FSM. Please enjoy this video highlighting the emerging industry that has resulted from the project.

This is the first in a series of videos about this project; stay tuned for more!

## AquaClip: Nile Tilapia First to Have Genome Sequence

*Taken from seafoodsource.com. April 8, 2011*

Using DNA from a line of tilapia developed at the University of Stirling's Institute of Aquaculture, scientists successfully sequenced the complete genome of Nile tilapia. This is the first commercial farmed fish species to have its genome sequenced.

The sequencing was carried out by the Broad Institute of Cambridge, Mass., which is part of the Massachusetts Institute of Technology and Harvard University, and the tilapia line was developed to have two identical copies of every part of its genome, which simplifies the processing of the genome sequence data.

The scientists who developed the sequence have also led research into the development of other lines of tilapia in the Tropical Aquarium facility at the Institute of Aquaculture in Scotland. These allow for the production of red tilapia, and nearly all-male populations, which prevents breeding in culture ponds before harvest.

"The sequence and associated data are now available to the scientific community worldwide, and should contribute to further advances in both basic science and aquaculture research," said the Institute of Aquaculture's David Penman. "For example, this should help us to find important genes affecting traits such as disease resistance, growth rate and sex determination, allowing more precisely targeted selection to improve aquaculture performance."

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.