

## Letter from the Director

Aloha!

As we dive deeper into a hot summer in the islands, I am reminded of my thoughts on global climate change and the current state of food security during a recent trip to the Western Pacific.

Yap State, located in the Federated States of Micronesia, is an unfortunate victim of the serious worldwide climate change dilemma. In Yap, I saw taro patches that once sustained life for generations that are now heavily salinated due to rising sea level; I was informed that this has caused the local food production industry to dwindle, resulting in an increased dependence on imported food. Unfortunately, this is a story that is all too common in the Pacific Islands.

Small islands, such as Yap, are particularly susceptible to the more noticeable effects of climate change including a rising sea level and an increase in intense storms, which can disrupt shipping lines. The people of Yap have expressed interest in exploring aquaculture as one possible solution to these life-altering problems. Aquaculture projects utilizing salinated taro patches that would otherwise be deemed useless can re-introduce sustainable food production to these islands, and at the same time minimize environmental impact and potentially benefit the local economy.

It is our desire at CTSA to administer the knowledge and tools available to us to help these struggling islands. Through strong aquaculture that is governed by best management practices, and that investigates and incorporates all local environmental and social factors, we hope to help enhance food and economic security throughout the Pacific region.

Please enjoy this issue of *Regional e-Notes* and, as always, if you have any suggestions, concerns, or comments, please do not hesitate to let us know.

Mahalo,

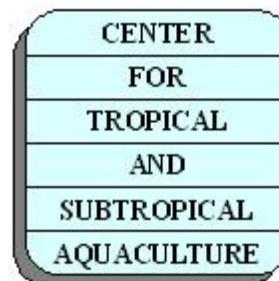
Cheng-Sheng Lee  
Executive Director, CTSA

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**CTSA-Sponsored Biosecurity Workshop a Success!**



*Biosecurity Workshop participants gather for a group photo at Windward Community College*

On Saturday, July 17, Dr. Clyde Tamaru of the University of Hawaii's College of Tropical Agriculture and Human Resources (CTAHR) led a CTSA-sponsored biosecurity workshop on the campus of Windward Community College. The workshop began with a presentation by Dr. Tamaru introducing the CTSA-funded project "Regional Biosecurity: Operational Biosecurity and Diagnostic Surveillance." The project, which is designed to mitigate disease problems in koi and tilapia stocks, began in February 2010 and is on target to meet its objectives over the coming two years. Saturday's workshop for tilapia and koi farmers is one objective of the project.

Dr. Allen Riggs of the Hawaii Department of Agriculture followed Dr. Tamaru with three interactive presentations. The first was about Koi Herpes Virus (KHV), a disease affecting Common carp, Koi, and Ghost carp that causes 80-90% mortality in susceptible populations. The disease can be transmitted through a variety of methods, including direct contact with infected fish (or their fluids), direct contact with water or mud that has been soiled by diseased fish, and fomites/vectors from contaminated systems. Signs of the disease include the appearance of white necrotic patches dispersed between normal red gill tissues, bleeding gills, sunken eyes, skin lesions, and a notched nose. However, latent carriers can carry the disease without showing any clinical signs and spread it to healthy yet susceptible fish. Therefore, laboratory tests are required to confirm an infection. While no currently available testing method can detect all carriers or survivors of outbreaks, PCR is the preferred test for diagnosing an active clinical infection. There is no treatment for KHV, and the virus can remain viable for three days in water without fish hosts. Therefore, Dr. Riggs expressed the importance of prevention, and stated that the best way to prevent a KHV outbreak is to quarantine infected fish for a minimum of 30 days in water ranging from 21-27C (70-80F), and then establish "reverse quarantine" conditions and conduct post-quarantine diagnostic screening tests. Additionally, any contaminated systems and equipment should be subject to thorough common disinfection protocols. Dr. Riggs concluded his first presentation with a brief discussion about another disease affecting Koi and goldfish: Spring Viremia of Carp (SVC). This RNA virus has a mortality rate of up to 70% in affected populations, and infection will result in FAD and mandatory depopulation as required by the State and USDA.

In a second presentation, Dr. Riggs discussed Hawaiian Rickettsia-like Organism (HRLO), a disease affecting multiple fresh and saltwater species including tilapia, grouper, seabass, salmon, and several ornamentals. The first report of RLO in tilapia occurred in Taiwan in 1992, where the disease originated at one farm and eventually spread to 37 facilities. In the mid 1990's, the disease was reported in Hawaii in farmed and wild populations of *Oreochromis mossambicus* and *Sarotherodon melanotheron*. In 2007, researchers discovered that the agent responsible for RLO is not a rickettsia, but rather a *Francisella* sp. bacteria. Low water temperatures for periods longer than seven days can lead to clinical outbreaks of HRLO, as can overcrowding, sub-optimum water quality, inadequate nutrition, or a presence of ectoparasites. Clinical signs of the disease include a darkening of scale color, emaciation, abnormal swimming behavior, eye lesions, enlarged spleen, and white granuloma nodules in many visceral organs (but not the liver). While observation of clinical symptoms is important in diagnosis, PCR assay is the preferred method of infection confirmation. Mortality rates of HRLO are lower than those of KHV; the average mortality rate is 30%, but it can be higher than 75% in severe cases. However, oxytetracycline medicated foods successfully decreased mortalities in outbreaks during the 1990's. Dr. Riggs' ended his presentations with a third on the Specific Pathogen Free shrimp program as a potential model for other species.

Vernon Nakamoto of the State Department of Agriculture, Plant Quarantine Branch, followed Dr. Riggs' presentations with a discussion about the rules and regulations governing the importation of species into the State of Hawaii. Mr. Nakamoto discussed the system of lists used to define animal importation limits: the "Prohibited" list contains animals that are prohibited entry into the State; the "Restricted" list contains animals that require a permit for import into the State and possession; The "Conditionally Approved" list contains animals that only require a permit for importation into the State. Any unlisted animals are deemed prohibited until they are officially placed on one of these three lists. In order to be placed on a list, a species needs to undergo a 3-tier review process where an Advisory Subcommittee looks at ecological factors, the Advisory Committee on Plants and Animals reviews environmental issues, and the Board makes the final decision based on all relevant factors and information. For more information on the process or to submit a permit request, [please visit the HDOA website.](#)

Following Mr. Nakamoto was Dr. Harry Ako, who introduced the CTSA-funded "DNA-Based Identifications of Tilapia in Hawaii" project on behalf of project P.I. Dr. Jinzeng Yang, who is traveling abroad. The focus of this project, which will commence on August 15, 2010, is to identify all existing tilapia strains in Hawaii using a DNA barcoding method, and either allow for importation of fast growing strains or develop DNA technology to select high-growth tilapia from existing local stocks. Recent developments in DNA technology make it an affordable and effective tool to identify different strains and growth traits of a species, which can be especially beneficial to tilapia farmers in Hawaii. Dr. Yang plans to gather information from local tilapia farmers and government agencies, collect fin clip samples from captive and wild populations, and conduct laboratory experiments to identify fish by DNA data and a corresponding online database.

The final presentation pertained to marketing, and was presented by Todd Lowe of the Aquaculture Development Program. Mr. Lowe outlined marketing tips for the nearly 40 industry members in attendance, stating that a concerted effort on the part of farmers is needed to successfully promote their products to a variety of markets, especially a receptive Waikiki tourism market that is always looking for a consistent supply of quality seafood. Mr. Lowe offered farmers tips and ideas to garner more sales, including marketing products under the "buy local" umbrella as a means to capitalize on current trends. Marketing remained the focus of the brainstorming session, which closed out the workshop. All participants were given the floor to share their opinions on steps the industry should take to improve their reach. The organizers posed the question "What are the next steps?" and received several creative, thought-provoking responses and ideas. Suggestions included holding cooking competitions and increasing public relations efforts to improve public opinion of tilapia, marketing products using boutique branding, and implementing a "live food" section in local stores. There was also the call for a concerted effort to boost farmer membership to the Hawaii Aquaculture and Aquaponics Association (HAAA), as well as cooperative marketing efforts. A sub-committee to develop a marketing co-op was formed during the brainstorming session, and information will be sent to HAAA members and included in future *Regional e-Notes* as it becomes available.

To view the presentations from this workshop (posted on the CTAHR website), [please click here.](#)

## Oceanic Institute Celebrates 50 Years, Looks Towards Bright Future

*Meredith Brooks interview of Dr. Tony Ostrowski, President of Oceanic Institute  
7/2/10*

This year marks the Oceanic Institute's (OI) 50th anniversary! In light of this milestone anniversary, OI president Dr. Tony Ostrowski has shared his thoughts with *Regional e-Notes* about the current and future states of the aquaculture industry, and where OI has and will fit in to the equation:



***CTSA: In your opinion, what is the biggest problem facing commercial aquaculture development in Hawaii today? Pacific-wide? Worldwide?***

TO: Hawaii is an extremely challenging state in which to conduct any business, particularly any farming business and our aquaculture industry is not immune. In addition to the usual high cost of doing business in Hawaii, our aquaculture industry seems particularly hard hit by regulations and

competing interest for usable land. Another issue is the aging of our current aquaculture industry; there appear fewer younger people to take up the mantle in the future. What Hawaii needs is a more farming friendly business and regulatory environment that will promote success which will provide incentive for the younger generation to become vested. Technically, our aquaculture industry in the state leads in many areas and we have had great support from our congressional delegations. Our affiliated Pacific Island nations have great potential and much incentive for aquaculture development given the hard economic conditions they are now facing. And Hawaii can be their resource for technology in many cases. The challenge is limited infrastructure. Federal and private investment is needed to assist. Worldwide, the aquaculture industry is growing by leaps and bounds. The challenge globally is to ensure aquaculture moves forward in an economically, environmentally, and socially sustainable manner. In general, in the developed world problems include high land and labor costs (and lack of capital), strict environmental laws, and (certainly in the U.S.) a lack of federal and state policies supporting the business of aquaculture. In the developing world, problems are associated with degradation of environmental quality and disease of target species, and lack of integration and technical sophistication.

***CTSA: What is the Oceanic Institute doing to work towards a solution to those problems?***

TO: OI is an applied research and development organization so our focus is on creating commercially applicable technologies and transferring them locally, nationally, and globally. We have several sustainable and advanced technologies for aquaculture that are being developed and some already developed that are now being transferred to industry locally and globally. We continue to work with our government partners and the private sector to fulfill our mission.

***CTSA: What food fish or seaweeds would you like to see developed to help increase Hawaii's food self-sufficiency?***

TO: Self-sufficiency for Hawaii with food fish aquaculture will have to go hand-in-hand with development of local feeds. Without cost-effective feeds produced locally, food fish aquaculture cannot advance much in our state or the Pacific. The reason we lost our broiler industry and the egg layer, dairy, cattle and hog industries are being threatened is because of the high cost of imported feed. Fortunately, and in the nick of time, we believe there is a critical mass of ingredients and economic conditions now that our state can look at producing its own feed or at least a portion of it to sustain all of our animal agriculture sectors including aquaculture. Seafood, slaughter house, fruit and even vegetable waste can be converted into usable ingredients economically; and use of these wastes helps reduce environmental footprint. Significantly, the promise of a biofuels industry in Hawaii including algae provides a high-protein co-product that can be used in aquatic and terrestrial animal feed. As long as we can provide locally made, cost-effective feeds, there are a large number of species that would be excellent candidates to support the seafood supply of Hawaii and export elsewhere. Other primary producers for biofuels development have potential in addition to lower trophic level filter-feeding organisms that can be incorporated into a polyculture system forwarding this general concept of sustainability and wise use our resources.

***CTSA: Are there any new aquaculture technologies or industry trends that YOU are particularly interested in supporting, or that you think might be the "future" of aquaculture (i.e. aquaponics)?***

TO: Aquaponics is one of several technologies that can be pursued. It is exciting, easy for even the hobbyist, and teaches sustainability, the idea of people reconnecting with nature and the environment and utilizing our resources wisely making sure they are available for future generations. This reconnecting is a growing trend worldwide as the U.S. in particular, but really has been imbedded in our Hawaiian culture for generations; we are just rediscovering it. Other forms of aquaculture including on-land recirculation and offshore cage culture can also be done in a sustainable manner. This is the future of aquaculture worldwide - pursuing sustainable technologies. It is happening now. Even the worldwide shrimp industry, which was not environmentally conscientious in the early heydays, is now becoming more environmentally oriented, more sustainable. It is clearly a focus for OI R&D.

***CTSA: What's new and next for the Oceanic Institute?***

TO: With the trend of increasing aquaculture production worldwide, we feel we are at the right place at the right time and well-positioned to continue the mission of the institute and develop and transfer new technologies for this growing industry. To position ourselves further there is an emphasis now on responsibly growing OI. Much of the funding we received over the last 10-15

years from the federal government to build our upper campus was dedicated towards transfer of technologies we developed over the last 20 years or so. Newer facilities are now being built and being pursued for the next generation of technologies we envision, some of which require a higher degree of scientific sophistication. You will see some major infrastructure changes at OI in the next year and two at Makapuu and on other islands. Over the last two years we have learned to thrive as a leaner, more engaged organization with newer business approaches that are absolutely necessary for non-profits to exist now, and a new model of technology transfer, emphasis on partnership with other organizations, private industry, and federal grantors, and soon, seeking out foundational support for our operational activities. All this will help with growth and acquiring the talent to take us to the next level. Also, and for the first time ever, we have an endowment that will help with our financial stability and priming of new projects. Our affiliation with Hawaii Pacific University has been very instrumental in many respects and our vision of the affiliation is to enhance the scientific and educational missions of OI as well as HPU. It is full steam ahead toward an exciting future!

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To celebrate its 50th anniversary, the Institute will host an open house and gala event in August. The open house will be held at the Oceanic Institute on Saturday, Aug. 21, and will consist of a fair with informational and activity booths for children of all ages, as well as live demonstrations of activities, such as shrimp tagging. Sen. Daniel Inouye, honorary event chair, will be a featured guest at the gala event "Seafood Sensation" on Aug. 25, which will boast exotic dishes prepared on-site by some of Hawaii's top chefs, including DK Kodama, Eric Leterc, Philippe Padovani, and Russell Siu, and live entertainment. The gala event will be held at Sea Life Park. To reserve your ticket or for more information, please contact Linden Hansink at [lhansink@oceanicinstitute.org](mailto:lhansink@oceanicinstitute.org).

## HAAA Meeting, UH Workshop, USDA Announcement

Hawaii Aquaculture and Aquaponics Association Meeting August 16, 2010

Register now for the annual HAAA conference in Hilo. Organized by the University of Hawaii's Benny Ron and Dr. Kevin Hopkins, this annual conference will feature a variety of notable speakers presenting on major opportunities for aquaculture in Hawaii, including aquaponics and open-ocean aquaculture, among others. Special guest speakers include Dr. Jim Rakocy, University of the Virgin Islands, and Dr. Gideon Hulata, Agricultural Research Organization, Israel. The one-day conference will take place at the Hilo Hawaiian Hotel and will be followed by the International Workshop on Aquaponics & Tilapia (IWAT) on August 17-19, and an Aquaponics Exploration Tour (AET) on the 20th. [For more information or to register for these events, please click here.](#)

Learn How to Make Your Own Fish Feed at the **"Utilizing Black Soldier Fly Larvae (BSFL) for Waste Recycling and Local Fish/Chicken Feed Production"** Workshop

On Saturday, July 31, 2010, the Waikiki Worm Company and the University of Hawaii's College of Tropical Agriculture and Human Resources (CTAHR) will welcome Robert Olivier, a pioneer in bioconversion technology and developer of the BioPod and ProtaPod, to present a morning workshop in Black Soldier Fly Larvae use and cultivation. The BSFL is a familiar denizen of compost and manure piles as well as well-fed worm bins, known for a voracious appetite and ability to rapidly break down organic waste. This powerful recycler at its harvestable stage is 42% protein, 34% fat and high in calcium in other nutrients, making it an ideal feed for fish and chickens in both backyard and commercial operations.

The workshop will be held at Windward Community College in Hale Akoakoa, Room 10. Doors open at 8:30 a.m. and the workshop is from 9:00 a.m. - noon. The workshop will consist of a lecture and on-campus field trip to a research demonstration, and a \$20 entrance fee includes written materials and refreshments. To register for this workshop, contact Mindy at [waikikiworm@hawaii.rr.com](mailto:waikikiworm@hawaii.rr.com) or 945-9676. Seating is limited so please make reservations early.

USDA Provides Emergency Assistance to Producers of Farm-Raised Fish

The USDA has announced that disaster assistance will be issued to livestock, honeybee and farm-

raised fish producers that suffered losses in 2008 because of disease, adverse weather or other conditions. The aid will come from the Emergency Assistance for Livestock, Honeybees and Farm-Raised Fish Program (ELAP).

More than \$10 million in disaster assistance, including more than \$6 million to compensate beekeepers for 2008 losses will be issued starting today, June 30. Under the program, producers are compensated for losses that are not covered under other Supplemental Agricultural Disaster Assistance Payment programs established by the Food, Conservation, and Energy Act of 2008, specifically Livestock Forage Disaster Program (LFP), Livestock Indemnity Program (LIP), and Supplemental Revenue Assistance Payments (SURE) Program. ELAP benefits related to 2009 losses are expected to be issued later this summer.

ELAP eligibility provisions have been amended for both honeybee and farm-raised fish producers. The modifications include allowing honeybee and farm-raised fish producers who did not replace their honeybees or fish that were lost due to a natural disaster to be eligible for ELAP payments based on the fair market value of the honeybees or fish that were lost. For more information about USDA Farm Service Agency disaster assistance programs, please visit your FSA county office or [www.fsa.usda.gov](http://www.fsa.usda.gov).

Contact: Isabel Benemelis (202) 720-7809, [isabel.benemelis@wdc.usda.gov](mailto:isabel.benemelis@wdc.usda.gov).

### Pacific Island Spotlight: \$5M Settlement Boosts Pacific Marine Conservation Plans

*Source: Saipan Tribune. Saturday July 10, 2010*

The largest civil penalty ever assessed by the National Oceanic and Atmospheric Administration will boost the Western Pacific Sustainable Fisheries Fund to implement marine conservation plans in the Pacific.

"This money has the potential to do a lot of good for the region, in particular our territories of American Samoa, Guam and the Northern Mariana Islands, which are all struggling economically, in helping them sustainably develop their fishing industry and infrastructure," said Alexa Cole, senior enforcement attorney for NOAA's Pacific Islands region.

Spanish company Albacora S.A., owner of the Albacora Uno, was charged June 2 with 67 counts of fishing inside the U.S. Exclusive Economic Zone in the western and central Pacific Ocean without a valid U.S permit over two years.

The Notice of Violation and Assessment, known as a NOVA, included a possible \$7.4 million civil penalty; after four days of negotiations, Albacora S.A. and NOAA reached a \$5 million settlement that will go into the Western Pacific Sustainable Fisheries Fund.

The Western Pacific Sustainable Fisheries Fund was established during the 1996 reauthorization of the Magnuson-Stevens Fishery Conservation and Management Act. Fines and penalties from violations by foreign fishing vessels that occur in the U.S. EEZ around one of the U.S. Pacific Remote Island Areas are deposited into the fund, which can only be used to support the conservation and management objectives under a marine conservation plan developed for the region by the appropriate governor and the Western Pacific Regional Fishery Management Council. Any funds or contributions received in support of conservation and management objectives under a marine conservation plan for any Pacific insular area also are deposited into this fund.

In addition to agreeing to a civil penalty, the company admitted the violations and promised to prohibit the Albacora Uno from entering U.S. waters, even in transit, for a period of three years. The terms of the agreement also require the company to develop and implement a company-wide monitoring program to ensure future compliance by its vessels.

"This settlement demonstrates the importance of strong enforcement to protect fisheries," said NOAA general counsel Lois Schiffer. "The significant penalty is a warning to other vessels in the region to comply with resource protection laws. By promptly taking responsibility for its actions and agreeing to steps to assure future compliance, the vessel owner is setting an example that should deter other violators."

The case against the Albacora Uno resulted from an investigation by agents with NOAA's Office of Law Enforcement. To report a suspected violation, contact NOAA OLE's national hotline at 1-800-853-1964. (NOAA)

## July AquaClips - Fish Farmers Market Makes Big Splash

*by Terrie Henderson, Big Island Weekly June 30, 2010*

Lovers of fresh fish are flocking to a new market in order to find some of the isle's best seafood.

On Friday, June 25, the Fish Farmers' Market was held at the Natural Energy Laboratory of Hawaii Authority (NELHA) Gateway Center in Kailua-Kona, where shoppers could purchase Big Island grown seafood fresh from the farms. A main purpose of the market is to help protect Hawaii's ocean resources and support sustainable aquaculture. The next market is scheduled for July 30 from 2-6 p.m. The market, which is only a few months old and falls on the last Friday of every month, had been gaining repeat customers and more vendors as word spreads of the fresh fish and other products for sale. There were also free tastings and cooking demos for visitors.

Michael Foley manned a booth featuring Big Island Abalone. He was also busy barbecuing the abalone. Abalone are edible sea snails with unique shells. Four grilled pieces could be purchased for \$10, or customers could purchase three live abalone for \$12...Joe Wilson, of Kona Cold Lobsters, Ltd., was on hand at the market to give customers helpful tips on how to prepare live lobsters and live dungeness crabs. Live Maine Lobsters, at 1.25 pounds, were on sale for \$15, live dungeness crabs were also \$15, and a bag of frozen lobster tails could be purchased for \$30...Kevin Hopkins, a professor of aquaculture at the University of Hawaii at Hilo, was manning a booth with volunteer Mari Horike at the fish market. The pair were handing out samples of farm raised sturgeon, and selling the fish.

Hopkins said the sturgeon are raised on a farm in Hilo in a partnership between private business and the university. Hopkins explained there are two types of sturgeon. He said what was being sold at the farmer's market were Siberian sturgeon. The Siberian sturgeon are being sold off so researchers can concentrate their efforts on the other type of sturgeon being raised in Hilo -- the Russian sturgeon. The Russian sturgeon is the fish that produces caviar, Hopkins said.

"The caviar, we hope to have it this winter coming up," Hopkins said.

"It's not a fish that anybody knows of here," Hopkins said, adding the smoked samples were important to see if people liked the taste.

For more on the market, find them on Facebook, Big Island Fish Market at NELHA. NELHA combination tours are available through the Friends of NELHA, <http://www.keaholepoint.org>, or call (808) 329-8073.

[To read the full article, click here.](#) If you are a farmer based on Oahu and you are interested in participating in a similar farmers' market, please contact Meredith Brooks of CTSA at [mbrooks@oceanicinstitute.org](mailto:mbrooks@oceanicinstitute.org).

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.