



### Seventh ISTA conference in Mexico a success

By Kevin Fitzsimmons  
University of Arizona

The Seventh International Symposium on Tilapia in Aquaculture was recently held in Veracruz, Mexico, from 6–8 September 2006. A total of 971 individuals attended the workshops, trade show, technical presentations, farm tours and tilapia dinner. This was the most successful of any ISTA conference and demonstrated the rapid growth of tilapia aquaculture as a global industry. ISTA 7 was organized by US and Mexican scientists from the Aquaculture CRSP and Aquaculture TIES projects, both supported by the US Agency for International Development, and their partners from Panorama Acuicola Magazine based in Mexico. The symposium was hosted by the Government of Veracruz. Governor Fidel Herrera Beltran provided the opening address, which included a description of the rapid growth of aquaculture, especially tilapia, in the State of Veracruz and announced a new package of investments in further support of aquaculture education, research, and production for the State.

A three-day workshop on recirculating aquaculture systems attended by 117 participants was held before the main conference.

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### Santiago courses well-attended, received



Photos by Suyapa Triminio Meyer

Workshop participants enjoy the hands-on training offered in a April 2006 workshop. Dominican and Hatian participants attended the workshop in Santiago, Dominican Republic.

By Suyapa Triminio Meyer  
Escuela Agrícola Panamericana  
El Zamorano, Honduras

On 10–11 April 2006, US Principal Investigators Dan Meyer, Suyapa Triminio Meyer, and Bill Tollner held a workshop covering two courses entitled, “International Course on Tilapia Culture and Marketing,” and “Pond Design and Construction for Aquaculture and Water Harvest,” in Santiago, Dominican Republic.

Members of the Association of Graduates of Zamorano in the Dominican Republic provided much of the preparatory work for the courses. This effort greatly contributed to the success of the



workshop. Forty-three people participated in the two-day course on tilapia culture, conducted by Dan and Suyapa Meyer. Topics included lectures on all stages of tilapia culture, including reproduction, production costs, pond construction, pond fertilization, nutrition and feeding, sex reversal procedures, and fundamentals for marketing and managing cultured tilapia. In addition, participants

... SANTIAGO continued on page 11

## Second International Symposium on Cage Aquaculture in Asia

By Jim Diana  
University of Michigan, Ann Arbor

The Aquaculture CRSP helped sponsor the Second International Symposium on Cage Aquaculture in Asia from 3–8 July 2006 in Hangzhou, China. Approximately 200 invited or contributing guests attended presentations on cage culture throughout the world. A unique aspect of CAA2 was the global overview on cage culture by Albert Tacon and a series of presentations of cage culture in different continents or countries. ACRSP Research Projects Manager Chris Bridger presented the report on North American cage culture. Reviews of current cage culture status were useful in understanding the magnitude and intensity of aquaculture and the importance of cages.

In addition to status reports, there were a number of keynote addresses. "Who will supply world's demand for fish," "Cage culture in China," and "Environmental interactions between cage culture and the surrounding water masses," were among the many relevant presentation topics. Over 150 contributed papers and posters were also presented at the conference.

ACRSP was involved in presenting best paper awards during the environmental impacts of cage culture session. Attendees from ACRSP included: Chris Bridger, C. Kwei Lin, Remedios Bolivar, Amrit Bart, Madhav Shrestha, and Jim Diana. In addition, students supported by ACRSP also presented papers at the conference.

One role of the ACRSP was to award best papers and best student papers on environmental impacts of cage culture. Diana and Lin co-chaired a committee to select awards for best papers on environment and aquaculture. The winners were: 1) Yang Yufeng and Fei Xiugeng from China for "Development of mariculture and bioremediation of seaweeds in Chinese coastal waters"; 2) R. Mayerle, W. Windupranata and K-J. Hesse from Germany for "Decision support system for sustainable environmental management of marine fish farms"; 3) Chongkim Wong, Chingyee Tse and Kingming Chan from Hong Kong for "DNA damage as biomarker for assessing effects of suspended solids on cage-cultured marine fish."

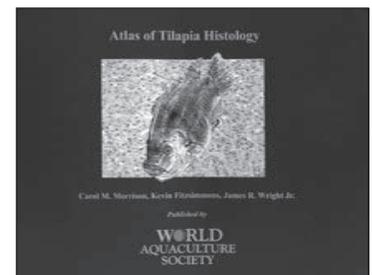
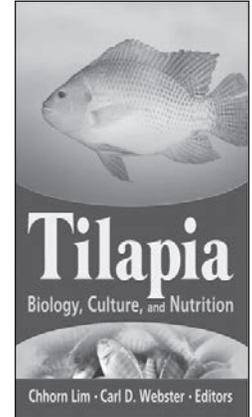
A committee appointed by AFS selected the best student paper prizes: Cai Huiwen and Sun Yinglan from China for "Environmental carrying capacity of cage aquaculture based on dry matter conversion rate in Xiangshan Harbor"; Xu Shannan, Zhang Hanye, Wen Shanshan, Luo Kun and He Peimin from China for "Integrating seaweeds into marine fish cage culture systems: a key towards sustainability"; Jiang Yusheng and Wu Xinzhong from China for "Characterization of a Rel/NF-kB homologue in a gastropod abalone, *Haliotis diversicolor supertexta*."

Overall, the conference was a tremendous success. Presentations provided a strong global overview of the current status of cage culture and were well attended. 

## Goings On ...

Congratulations to colleague Joseph Molnar, who has been promoted to Coordinator for the Office of International Agriculture in the College of Agriculture at Auburn University in Auburn, Alabama.

Kudos and Congratulations to Chhorn Lim for his work on the book, "Tilapia: Biology, Culture, and Nutrition." Lim co-edited the 678-page book with Carl D. Webster. In addition to Lim, other ACRSP researchers authored a number of chapters in the book, printed by Food Products Press. Thanks go to Kevin Fitzsimmons, Carole R. Engle, Yang Yi, and Claude E. Boyd for their efforts in writing this book.



Congratulations to Kevin Fitzsimmons and Wilfrido Contreras de Sánchez for the successful completion of the "ISTA 7" proceedings. Fitzsimmons is also to be congratuated for his new book "Atlas of Tilapia Histology."

This season marked the departure of two long-term ACRSP staff members, Joan Westfall and Jeff Burright.



Joan, after 37 years with Oregon State University and six with the ACRSP, has retired. We thank her for her contributions to the program and the community.

Jeff, who has been with us for five years — four as a student — has moved on to pursue his blossoming career in environmental writing.



We wish Joan and Jeff both success and happiness.

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## Graduate Student Profile: Md. Asaduzzaman

Md. Asaduzzaman

Bangladesh Agricultural University, Mymensingh, Bangladesh

Md. Asaduzzaman, a Bangladeshi student, has been working on Aquaculture CRSP sponsored projects under the supervision of Md. Abdul Wahab (BAU) and Yang Yi (Asian Institute of Technology) since completion of his Bachelors degree in June 2004. He worked as a research fellow in a number of ACRSP funded research projects entitled “New paradigm in farming of freshwater prawn (*Macrobrachium rosenbergii*) with closed and recycle systems,” “Integrated cage-cum-pond culture systems with high valued climbing perch (*Anabas testudineus*) in cages suspended in carp polyculture ponds” and “Use of rice straw as a resource for freshwater pond culture.”

Asaduzzaman completed a B.Sc. Fisheries (Honors) from the Faculty of Fisheries, Bangladesh Agricultural University. He received the “Prime Minister Gold Medal Award” in recognition for excellent results during his B.Sc. After completing his Bachelor’s degree, he was inspired by CRSP Host Country Principal Investigator Wahab to study for his Master’s degree in Fisheries Management. This led him to the ACRSP-supported work “The potentials of organic farming of freshwater prawn in Bangladesh.” He successfully defended his thesis in December 2005 and earned recognition as best M.Sc. student in the department.



Photo by Md. Asaduzzaman

Md. Asaduzzaman’s system for research on freshwater prawn.

In the future, Asaduzzaman wants to implement his knowledge of aquaculture from the classroom into practice for sustainable aquaculture development in Bangladesh. To make this a reality, he plans to study for a Ph.D. in crustacean aquaculture with a focus on farming systems management and monosex culture strategies.

Although he was involved in a number of finfish research projects with CRSP, his interests focus on freshwater prawn farming systems. Some of his findings on freshwater prawns were presented by Dr. Wahab at the AQUA 2006 conference in Florence, Italy in the crustacean aquaculture



Graduate student Md. Asaduzzaman near ACRSP ponds in Mymensingh, Bangladesh.

session. His presentation was entitled “Farming systems of giant freshwater prawn *Macrobrachium rosenbergii* in Bangladesh: A combination of tradition and technology.” The study demonstrated that there were both traditional and improved extensive (combination of traditional and new techniques) freshwater prawn farming systems in terms of management practices. The study revealed that farmers faced problems with limited access to credit, insufficient supply and high price of quality post-larvae, high price of quality feed, transport and marketing problems, natural disasters, lack of institutional and administrative support, and inadequate infrastructure and extension services.

Asaduzzaman’s present aim is to raise freshwater prawn productivity without the massive investment common to many intensive systems by combining and upgrading two approaches. The first one is based on microbial control of water quality and recycling of protein through the adjustment of the carbon/nitrogen ratio in the pond. The second one is based on the application of vertical substrates and development of periphyton in extensive ponds, increasing productivity by 70–250%. This new technology is referred to as “C/N controlled periphyton based pond (C/N-CPP) systems.” To develop this technology, an experiment has been set up on “The effect of C/N ratio control by addition of carbohydrate to the water column in freshwater prawn post-larvae nursing and grow out systems.” The expected outcome of this technology will benefit both Bangladesh and exporting countries. Dr. Marc Verdegem from the Wageningen University has been assisting as an external expert.

To meet Bangladesh’s challenges, it is urgently necessary to increase average pond productivity. Raising aquaculture production through pond expansion would demand large additional quantities of water and land area, which are both very scarce resources in Bangladesh. In consequence, the only practical and sustainable way to raise pond aquaculture production is by increasing pond productivity per unit of land area and water. With the present state of knowledge, higher pond yields can be obtained by applying energy, capital and technology but these inputs are

... **PROFILE** continued on page 9



Photo by John Alejandro Calvijo-Ayala

Brazilian researchers, graduate students, fish producers and extension personnel attended the recent workshop at CAUNESP.

## Brazil hosts Larviculture of Neotropical Fish workshop at CAUNESP in August

Maria Célia Portella  
Universidade Estadual Paulista, Brazil

A workshop on Larviculture of Neotropical Fish was held 12 August 2006 at the Aquaculture Center of the Sao Paulo State University (CAUNESP) in Jaboticabal, Brazil. The objective of this activity was to disseminate information gathered as part of the research collaboration between CAUNESP and The Ohio State University that potentially can benefit fingerling producers of *paku* (*P. mesopotamicus*) and South American catfishes (surubins) of the genera *Pseudoplatystoma*, both species of economic importance and high priority for aquaculture in Brazil.

The Aquaculture Center was formed in 1988 to promote the generation and diffusion of knowledge related to aquaculture, aquatic biology, and management of aquatic ecosystems. CAUNESP also has one of the strongest and most rapidly expanding education programs in Aquaculture in Brazil, and offers programs leading to M.Sc. and Ph.D. degrees, contributing to training of qualified professionals to work in universities, research institutes and technology transfer programs.

In 2002, CAUNESP started a scientific collaboration with Konrad Dabrowski at The Ohio State University to develop a project entitled "Mass production of juveniles of subtropical fish (*Piaractus mesopotamicus* and *Pseudoplatystoma* sp.) with natural and artificial diets in different production systems." Funding was provided by The National Council for Scientific and Technological Development – CNPq, Brazil, a foundation linked to the Ministry of Science and Technology to support Brazilian research. The ACRSP Eleventh Work Plan, through the project "Broodstock development and larval feeding of Amazonian fishes," also supported part of this research.

After about three years of intensive research on larval rearing, management and formulation of better microdiets for fish larvae, most of the results were already disseminated by scientific articles, seminars and scientific meetings. What was still needed was to transfer information related to production tech-

## Notice of Publication

Notices of Publication announce recently published work carried out under Aquaculture CRSP sponsorship. To receive a full copy of a report, please contact the author(s) directly.

AQUACULTURE CRSP ACCESSION NUMBER: 1300

EFFECT OF DIETS FORMULATED WITH NATIVE PERUVIAN PLANTS ON GROWTH AND FEEDING EFFICIENCY OF RED PACU (*PIARACTUS BRACHYPOMUS*) JUVENILES

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Mary Ann G. Abiado and Kyeong-Jun Lee  
The Ohio State University, School of Environment and Natural Resources, 2021 Coffey Road, Columbus, Ohio 43210 USA

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We evaluated the effects of casein-based semipurified diets, alone or supplemented with native Peruvian plants, on growth, feed efficiency, and histology of the digestive tract of red pacu, *Piaractus brachyomus*, juveniles over an 8-wk feeding trial. Three tanks were randomly assigned to one of four substitution of three South American native plant as follows: camu-camu fruit (*Myrciaria dubia*), aguaje fruit (*Mauritia flexuosa*), or maca tuber meal (*Lepidium meyenii*). The fish (initial weight,  $2.04 \pm 0.06$ g) were fed experimental diets at decreasing feeding rates from 4 to 2.6% of body weight. After 8 weeks of feeding, fish fed a diet supplemented with maca meal showed significantly higher ( $P < 0.05$ ) weight gain, specific growth rate, protein efficiency ratio (PER), apparent net protein utilization (NPU), and instantaneous feed intake than fish fed other diets. Feed conversion ration (FCR), PER, and NPU in fish fed the casein-gelatin diet supplemented with maca meal were among the best ever reported in the scientific literature,  $0.64 \pm 0.03$ ,  $3.13 \pm 0.15$  and  $23.8 \pm 2.0$ , respectively. The camu-camu meal had a negative impact on diet palatability and utilization, which resulted in slower growth. The stomach, intestine, pancreas, and pyloric caeca at the start and end of the experiment showed normal differentiation and appearance of cells and tissues. The liver parenchyma showed lipid infiltration and pigment accumulation in all samples at the initiation of the experiment and may be attributed to the period of decreased feed intake prior to the study. At the end of the study, similar histopathologies were recorded in all samples from the control and camu-camu groups. Normal liver histology (polyhedral hepatocytes with centrally located nuclei) was observed in two of three samples from the maca group and all the samples from the group that was fed the aguaje-supplemented diet.

This abstract is excerpted from the original paper, which was published in *Journal of the World Aquaculture Society*, Vol. 37, No. 3 in September, 2006. 

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## Bangladesh visit offers unique insight to U.S. researcher

Paul Olin  
University of California at Davis,  
and California Sea Grant

The technical exchange visit— jointly funded by NOAA Sea Grant and CRSP— began with the arrival of Paul Olin at Dhaka International Airport 22 April 2006 where he was met by Md. Abdul Wahab, Professor of Limnology and Fisheries, Department of Fisheries Management, and Mostafa Ali Reza Hossain, Professor and Chair of the Department of Fish Biology and Genetics at Bangladesh Agricultural University (BAU). The three traveled to the BAU campus in Mymensingh.

The following morning Wahab gave Olin a tour of BAU Fisheries. Olin met a number of faculty — including Dean of Faculty Muhammad Bazlur Rashid Chowdhury, N. Ahmed and M.A. Islam — and visited laboratory facilities including the water quality, fish nutrition, and fish disease laboratories. In the evening the group toured the aquaculture research complex outside the main campus center which includes a number of ponds and a hatchery with successful trials underway spawning and rear-

ing Indian major carps, Rohu, Catla and common carp. Olin attended presentations and met several graduate students — Kunda and Tanni — conducting research on prawn and tilapia culture. He also viewed research ponds used by Hossain for evaluating the nutrient contribution of rabbit and goat manure to produce fish and prawns.

On the morning of 24 April, the group traveled to Dauki, where they toured a village aquaculture project that cultures prawns in combination with the small Mola Carplet and larger Catla. The prawns are a recent introduction to village aquaculture and are prized as a source of revenue. They exhibit rapid growth. The Mola Carplet was recently recognized as a valuable product as well because of the high vitamin-A levels found in the fish's eye. This is now recognized as a significant benefit to the health of villagers, especially pregnant and nursing mothers.

The group then visited a fish hatchery where an entrepreneurial owner is producing seed of Thai *Anabus testudinens* and the Asian carps, Rohu and Catla. Wahab recently collaborated with this owner



Photo by Mustafa Hossain  
Paul Olin and Md. Abdul Wahab stand in front of an ACRSP site in BAU Mymensingh.

to produce a manual on hatchery production of *Anabus*. The group then returned to BAU, where they toured campus facilities and observed many varieties of improved fruits grown in research fields.

On 25 April, the group (Hossain, Olin, Wahab, and Zoarder Faruque Ahmed) traveled to Bogra to meet with fisheries biologists and managers in the region of the Chalan Beel. The group participated in a workshop focused on the needs of fisheries resources in the Chalan Beel, activities which threatened fish populations, and management needs to facilitate their recovery.

Professor Wahab opened the workshop with a welcome and brief introduction, followed by general introductions, and a presentation by Hossain on the current status and resources of the Chalan Beel, a large natural depression that seasonally floods with the onset of the monsoons.

Among many large water bodies, the Chalan Beel and its floodplain is the most important watershed in North Central Bangladesh, serving about 10 million people by providing agricultural crops, fish and aquatic products, and pasture lands for livestock. Once Chalan Beel was



Photo by Mustafa Hossain

From left: Graduate student Md. Asaduzzaman (Bangladesh), graduate student Sunila Roy (Nepal), Md. Wahab, Paul Olin and Shamim (Department of Fisheries, Bangladesh).

... **BANGLADESH** continued on page 11

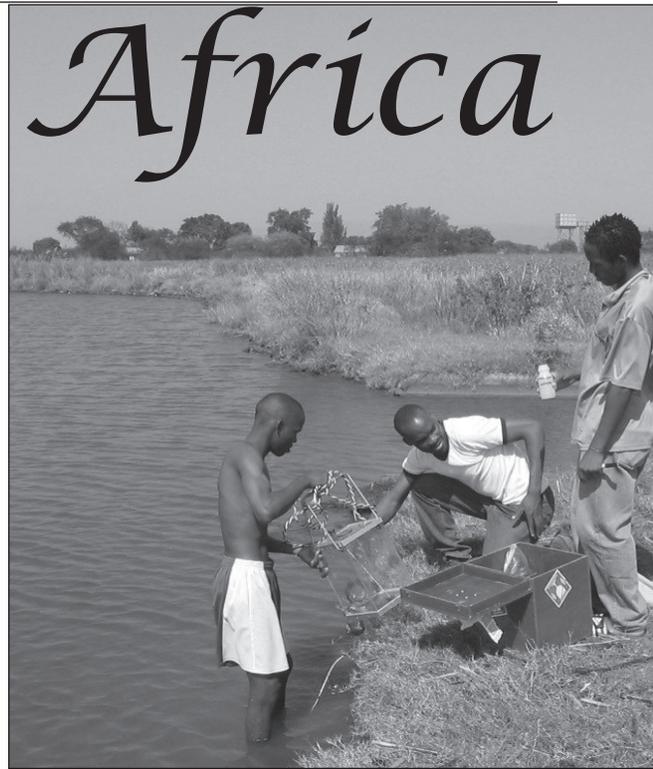
# ACRSP in

# Africa



Photo by F. Lagat

Farmer training by an ACRSP-trained farmer in Kenya.



From left: Phiwa Ndlazi, Mbongeni Khanyile and Bonginkosi Ntuko collect water samples in KwaZulu-Natal in South Africa.



Photo by Khalid Salie

On-site pond management training in South Africa



Abe Anthony, left, harvests rainbow trout at a Rustenberg fish farm.

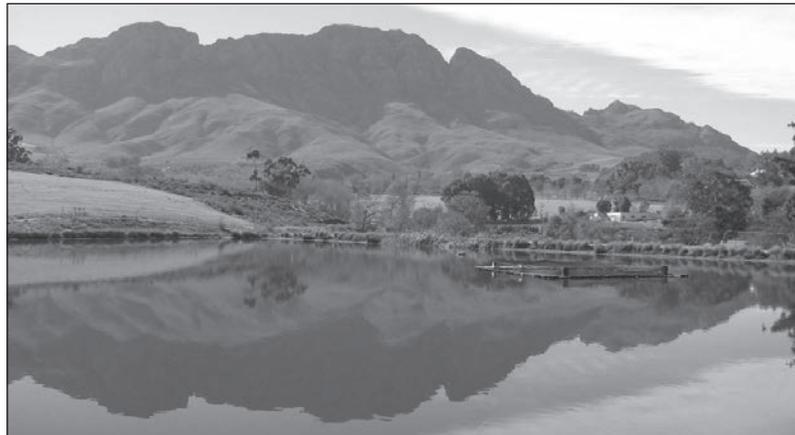


Photo by Khalid Salie

Rustenberg small-scale cage system in South Africa.



Photo by Khalid Salie  
ani gathering water quality



Researchers at Sagana fish farm lab  
equipped by ACRSP, Kenya.



Photo by Khalid Salie  
Lourens de Wet in  
his recirculation  
laboratory.

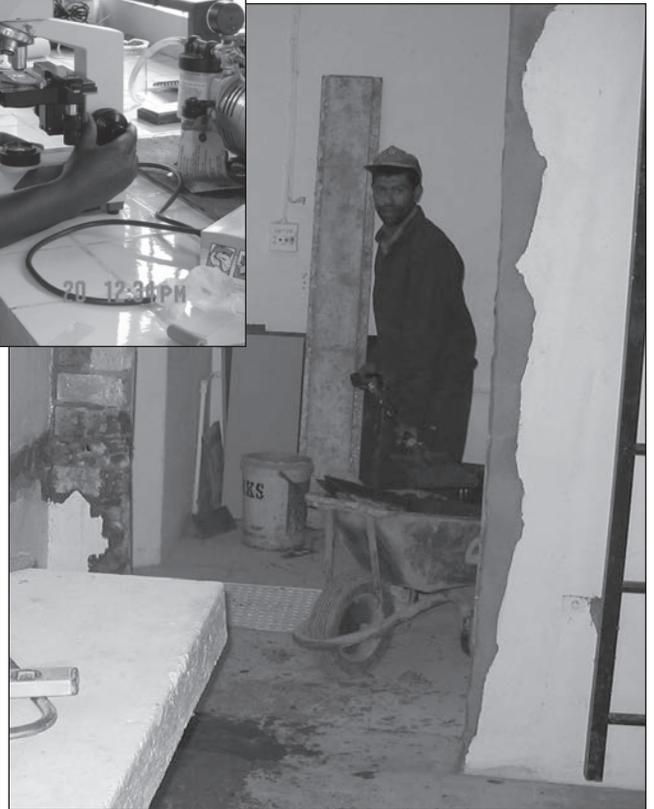


Photo by Khalid Salie  
Construction of new nutrition lab in South Africa



Photo by Khalid Salie



Photo by Samara Velthuysen  
Khalid Salie consulting Brian  
Meyer, a new fish farmer.



Photo by Khalid Salie  
Post-graduate student, Codlin Meyer, in the water ecology lab.

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This workshop was also sponsored by a joint ACRSP- NOAA Sea Grant project under Cornell University and was conducted by a team including Mike Timmons, Raul Piedrahita and James Ebeling. They were assisted by Margarita Cervantes Trujano and Eunice Perez-Sanchez, from the Instituto Tecnológico de Boca del Río and Universidad Juárez Autónoma de Tabasco, respectively. Dallas Alston, from the University of Puerto Rico, provided the keynote address, "Global outlook of tilapia aquaculture with emphasis on Latin America." Concurrent sessions over the next two and half days covered the entire field of tilapia aquaculture with presentations on reproduction and genetics, pathology, nutrition, production systems, processing and markets. A trade show held in conjunction was well attended and included most major suppliers of aquaculture equipment, feeds, and fingerlings.

During the conference three new reference books debuted with strong sales at the authors' signing party. "Atlas of Tilapia Histology," co-published by the Aquaculture CRSP and World Aquaculture Society, was presented by one of the co-authors, Kevin Fitzsimmons. "Tilapia: Biology, Culture, and Nutrition," published by the Haworth Press was presented by co-editor Chhorn Lim. "Tilapia Culture," published by CABI, was launched by author Abdel-Fattah El-Sayed. The Tilapia International Foundation also presented the Jan Heijne Memorial Award to Kevin Fitzsimmons in recognition of his life-time contributions to tilapia aquaculture. The Dutch Ambassador to Mexico presented the award.

A gala tilapia dinner was provided on the third night of the conference, with ten restaurants each providing two tilapia

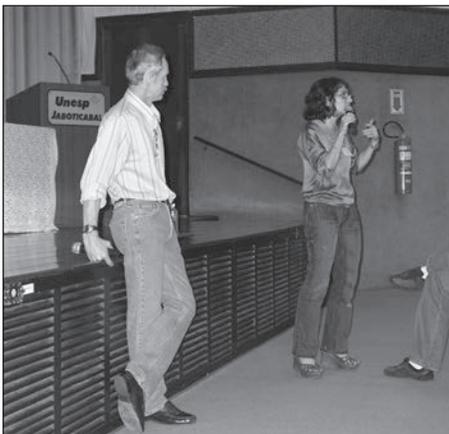


Photos by Eric Roderick of Swansea University  
Three books debuted at ISTA 7, two of which included work from ACRSP researchers. Here Fitzsimmons and El-Sayed present their books.

apia dishes that delegates were invited to taste. The delegates promenaded past the restaurant booths prior to selecting their dinner accompanied by mariachis and local folk dancers in accordance with Veracruzana tradition.

On the final day of the symposium a farm tour visited four farms around Veracruz. Farms ranged from a large industrial farm focused on international sales, to intermediate farms for local sales, to a small farm integrated into a restaurant chain that sells all their products locally. 

... *BRAZIL continued from page 4*



Photos by John Alejandro Calvijo-Ayala  
Konrad Dabrowski and Maria Célia Portella.

nologies to potential users in Brazil. A meeting was planned for a group of 20 to 30 farmers, but by the second day after the announcement more than 60 had registered. So, Portella reserved a larger room, the Convention Center of the University (UNESP), and more than 100 people attended, mostly graduate students, but also fish producers, extension personnel and re-

searchers from several states of Brazil, including researchers from Amazonas, Minas Gerais, Rio de Janeiro, Paraná, Mato Grosso do Sul, Goiás, São Paulo and Brasília.

The program covered an overview of state-of-the-art larval rearing techniques of paku and surubim and new results about feeding and nutrition of these species. In the sequence, Rosângela Kiyoko Jomori, a recent Ph.D. graduate of CAUNESP, presented the results of the performance, survival rates and economic evaluation of paku fingerlings reared directly in ponds. She also showed results for larvae initially raised in the laboratory. She demonstrated the efficiency of an experimental indoor intensive system for increasing survival during initial culture of paku larvae and the economic advantage of this system. Rodrigo Takata, M.Sc. student at CAUNESP, presented recent advances in the use of live food for surubim (*P.fasciatus*) and the potential of the rearing of several neotropical species

in low salinity (2 – 4%) water.

Dabrowski provided participants with international perspectives on rearing native Brazilian fish in the U.S. He presented "Rearing of larval and juvenile South American catfish (*Pseudoplatystoma fasciatus*) using live and formulated diets" and "Evaluation of growth and maturation of South American catfish (*Pseudoplatystoma sp.*) in captivity." Results were obtained largely due to the collaborative project supported by CNPq and the ACRSP. At the end of the presentations there was time for discussion and exchange of hands-on-experiences.

Considering the multidisciplinary and multi-institutional nature of the project — dealing primarily with evaluating the aquaculture potential of local and native species in Brazil and the development of new culture technology — the results of this investigation and the transfer of the technology certainly will contribute to sustainable aquaculture in the region. 

# 2006 IIFET Conference in Portsmouth: Student Awards



Photos by Ann Shriver

First prize winner, Ajao Olajide of Ladoke Akintola University of Technology, Nigeria receives his award from Jimmy Young of the University of Stirling.

The Aquaculture CRSP cosponsored the 2006 International Institute of Fisheries Economics and Trade (IIFET) conference in Portsmouth 11–14 July. ACRSP funds were used to partially support the costs for four researchers to attend the conference.

- Abdoulkarim Esmaili of Shiraz University, Iran, presented, “Assessing the Competitiveness of Shrimp Farming in Iran: Using PAM Approach.”
- Julita Ungson of the College of Aquatic Sciences and Applied Technology, Mariano Marcos State University, Philippines, presented “An Economic Assessment of Sea Urchin (*Tripneustes gratilla*) Culture.”
- Taiwo Mafimisebi of the Federal University of Technology, Akure, Nigeria, presented “Comparative Yield Performance of Upland and Magrove Aquacultural Farms in Selected Maritime States of South West Nigeria and Are Middlemen Really Exploitative? Empirical Evidence from the Sun Dried Fish Market in South West Nigeria.”

- Francis Tazoacha of the Action Centre for Rural Community Development in Cameroon presented, “Creating Better Market Avenues for Aquatic Products in Sub Saharan Africa in the Wake of Globalisation.”

The winners of a contest for best student abstracts were:

### First Prize:

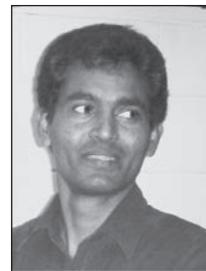
Ajao Olajide (pictured at left) of Ladoke Akintola University of Technology, Nigeria for “Non Radical Technical Efficiency of Fish Farms in Oyo State, Nigeria.”

### Second Prize:

Poulomi Bhattacharya of the Institute for Social and Economic Change, India, for “Comparative Economics of Traditional vs. Scientific Shrimp farming Systems: A Study of Smallholders’ Shrimp Culture in West Bengal.”



Bhattacharya



Kularatne

### Third Prize:

Mohottala G. Kularatne of the University of Portsmouth, United Kingdom, for “Investigation of Socioeconomic Characteristics of Agricultural Communities in Relation to the Development of Culture-Based Fisheries in Non-Perennial Reservoirs of Sri Lanka.”

Each supported participant, whether researcher or student, was able to present his or her own research, and receive valuable input about the analytical techniques they are using. Some met researchers who have done similar work in other regions of the world while others were provided with critical feedback on their work. Through this opportunity, several longer-term research relationships and projects have been developed through contacts made at this conference.

... **Goings On** continued from page 2

With their departure, the Aquaculture CRSP would like to extend a warm welcome to Dwight Brimley and DD Bixby, their respective replacements. New Office/Business Manager Dwight Brimley comes to the ACRSP with 18 years experience in accounting. He has worked at OSU for five years. DD Bixby, who replaces Jeff as Publications Manager, is completing two degrees at OSU and has more than four years of experience in communications and journalism. 

... **PROFILE** continued from page 3

out of reach for the majority of people in Bangladesh. Therefore, the challenge is to develop a simple technology that raises pond productivity in a sustainable way while minimizing the inputs of energy and capital. When describing the future prospects for aquaculture development in Bangladesh, Asaduzzaman said there is huge potential for “aquaculture development in Bangladesh through the culture of suitable species into unutilized water bodies, improvement of current culture practices, development of suitable low-cost technology and the motivation of the farmers.”

“Aquaculture CRSP gives me the opportunity to visit the major freshwater prawn farming areas of Bangladesh and I enjoyed many things related to prawn farming at the field level,” he said when asked the most enjoyable experience from his work with the ACRSP. 

# Aquaculture CRSP in Honduras



Photo by Suyapa Triminio Meyer  
Hands-on tilapia processing course.



Photo by Adonis Gallindo  
Dan Meyer and farmers look at tilapia catch.



Photo by Adonis Gallindo  
Stocking fingerlings at Olancho



Photo by Suyapa Triminio Meyer  
Adonis teaches how to count fingerlings



Photo by Suyapa Triminio Meyer  
Cooking tilapia at a community fair.

... *SANTIAGO* continued from page 1

involved in a field exercise practiced identifying tilapia sexes from a farmer's pond.

Each participant received free electronic copies of the manuals "Introduction to Aquaculture" (159 pages) and "Practices in Aquaculture" (119 pages), and printed copies of the ACRSP manuals "Tilapia Culture Using Low-Cost Inputs" and "Determining Costs for Small Scale Tilapia Culture: the Importance of Technical and Accounting Record Keeping."

To measure the impact of the course, a 20-question quiz was given to participants beforehand. The average score was 60%. After the course was finished, the quiz was administered again. This time the average score was an 89%, or a 50% improvement over the initial administration.

The second course — on pond design and construction, presented by Bill Tollner—was held simultaneously with the tilapia course on 10 April. There were a total of 24 participants from the Dominican Republic and Haiti, with about half from each country.

... *BANGLADESH* continued from page 5

the largest natural fishery in the country but fisheries production has declined dramatically. It is now nearly abandoned due to impacts of Flood Control Drainage and Irrigation (FCDI) facilities and siltation. The present level of annual fish production is about 11,000 MT from 70,000 ha of water area which is extremely low averaging about 160kg/ha. The livelihood of about 100,000 fishermen living on aquatic resources of the Chalan Beel are threatened as a result of land use changes and declining fisheries production. It is therefore imperative that efforts be made to develop ecosystem-based management strategies for this important water body. These strategies are now being developed with input from scientists, resource managers, local officials and involved stakeholders with the objectives of enhancing production, maintaining biodiversity and improving the livelihoods of poor fishermen.

As a first step, this workshop sought input from the assembled researchers, scientists, managers, and fishermen on the current status of the Beel and its resources, and sought suggestions for improved management. The process involved three breakout groups that brainstormed responses to a number of questions and then reconvened to hear presentations. The other two groups reacted to, added or modified some points. The use of sanctuaries was discussed, and there was unanimous support for the two small existing sanctuaries in the Gur River. One river sanctuary consists of four hectares restricted to fishing.

That evening the NOAA / ACRSP group traveled to Adamdighi to view a progressive prawn farm where the owner is using advanced technology to produce prawns, including monosex culture. This farmer has developed his own feed and hatchery after initially contracting with Charoen Pohkpand (CP) for these services.

The group visited a fish hatchery and farm operated by Akhteruzzaman, a Senior Upazilla Fisheries Officer in the Singra subdistrict, on 26 April. From there they trav-



Photo by Leonel Guerrero

ACRSP researchers hosted a two day workshop attended by 24 people. Participants came from both the Dominican Republic and Haiti.

As a result of both courses, relationships were established with institutions in both countries, and there is interest in research and additional training. 

eled to the fisheries office of a senior fisheries biologist, Zaman, of the same subdistrict, and then on to the Gur River where they hired a boat and visited a fish sanctuary that has been responsible for a ten-fold increase in harvest and revenue to the local government. Following this activity a quick stop was made at a historic site which was previously the residence of the regional administrator and tax collector under British colonial rule and is now a secondary administrative headquarters and capital of the country.

The group then visited Bhuiya, District Fisheries Officer (DFO) in Natore and enjoyed a cool green coconut before stopping in the Pobna district, Upazilla Bhangara in Chatmahar to visit subdistrict administrator Muhammad Mizanur Rahman and local fisheries officer Said. Afterwards the group toured some of the district projects Rahman has initiated including a guest house, prayer lawn, and school for youth. They then met briefly with the Chatmahar Upazilla Fisheries Officer and returned to BAU.

Olin presented a seminar — attended by about 50 people — to the faculty of Fisheries and graduate students at BAU on 27 April. Later that afternoon Wahab, Hossain, Olin and Rahmatullah traveled south along the Bramaphutra River to view a sanctuary established in the river by the Department of Fisheries to restrict fishing.

On 28 April the project team met to evaluate results from the workshop and develop a consensus on which subdistrict would be the best focus for further restoration efforts to maintain and enhance sustainable fisheries while conserving and increasing biodiversity. It was determined that the Upazilla Singra in the Natore district would be the ideal location for future work. The highland area in the middle of the subdistrict is surrounded by the Chalan Beel. During low water there are three smaller beels in the area increasing in size. From east to west they are Dhalia, Italy and Tajpur. The selection of this important area as the primary focus was the consensus of the Project Team and the local fisheries biologist Said. 

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*Aquanews* is published quarterly by the Aquaculture Collaborative Research Support Program, Oregon State University, 418 Snell Hall, Corvallis OR 97331-1643. [pdacrsp.orst.edu](http://pdacrsp.orst.edu)

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The Aquaculture Collaborative Research Support Program is funded in part by the United States Agency for International Development under CRSP Grant No. LAG-G-00-96-90015-00 and by participating US and host country institutions.

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