

AQUANEWS

THE NEWSLETTER OF THE POND DYNAMICS/AQUACULTURE COLLABORATIVE RESEARCH SUPPORT PROGRAM

Volume 10, Number 1/Fall 1995

Oregon State University

ISSN 1062-4996

CRSP PROPOSAL IS TOPIC OF STRATEGIC MEETING

By Brigitte Goetze



Boyd Haight, Senior Aquaculturist for FAO/ALCOM, points out topographical features of Zimbabwe to OSU researchers. Haight worked with site selection committee members to explore the potential of Zimbabwe and other southern African countries as new sites for PD/A CRSP research.

In July, CRSP representatives met with USAID in Washington, DC to discuss the status of the CRSP's continuation proposal and to determine an action plan for the proposal submission process. The CRSP was represented by Board of Directors Chair Oneal Smitherman, board members Robert Fridley and Phil Helfrich, Technical Committee Co-Chair Bryan Duncan, External Evaluation Panel member Gary Jensen, Director Hillary Egna, and Deputy Director Brigitte Goetze. They conferred with Ann van Dusen, Senior Deputy Assistant Administrator of the Global Bureau, and the following Center for Economic Growth mem-

bers: John Lewis, Director of the Office of Agriculture and Food Security, Harvey Hortik, Division Chief of the Sustainable Technology Division, Harry Rea, Aquaculture Specialist, Mildred Blakeney, Program Analyst, and Fred Johnson, BIFAD Support Staff. Part of the meeting was also attended by Lamarr Trott, Senior Fisheries Advisor of the Office of Environment and Natural Resources in the Center for Environment. The attendees discussed the importance of aquaculture for food security and economic growth, and the lessons learned from the administration of all CRSPs. They developed a proposal submission schedule for the PD/A CRSP's continuation proposal. USAID informed the CRSP that a new Board for International Food and Agriculture Development (BIFAD) has been selected (see story, p.10). BIFAD will convene in September and will be involved in the review process of the continuation proposal, which is slated for late November or early December. Submission of the best and final proposal is planned for early January.

SITE SELECTION COMMITTEE CONTINUES SEARCH

The PD/A CRSP site selection committee has been actively researching opportunities to establish a new CRSP site in Africa. Members of the committee have engaged in site visits, attended meetings with possible collaborators, and established contacts with researchers from many institutions in order to further the selection process.

Recently, Boyd Haight, of ALCOM, visited the OSU campus to discuss the opportunities for collaboration in Zimbabwe

and other parts of eastern and southern Africa. He indicated that the CRSP approach to regionalizing aquaculture research resonates with the approach taken by the major research organizations already in place.

Representatives of the site selection committee will visit Zimbabwe this fall to attend the ALCOM planning meeting, and to explore with the assembled researchers the potential for PD/A CRSP collaboration

in several eastern and southern African countries. Catherine Knott, a rural sociologist and Director of Women in International Development at OSU, will join the site visit team in order to respond to the expressed needs of Missions and other donor agencies to expand CRSP research to include social variables. In addition, the team will stop in Kenya to follow up on earlier meetings which identified possible areas of mutual interest and cooperation.

DIRECTOR'S DESK

The Management Entity is in the midst of finalizing the CRSP plan for 1996-2001, which is due to USAID by 1 October 1995. The process for developing a CRSP research agenda has been lengthy — lasting over four years and involving hundreds of people.

The CRSP was invited to design a continuation plan upon receiving a positive review from the External Evaluation Panel. Building on recommendations from the December 1993 EEP Quinquennial Report, the CRSP conducted a critical analysis of documents pertaining to aquaculture research and development. From this review, a Request for Pre-proposals was developed and issued in January 1994 to CRSP and non-CRSP institutions.

Pre-proposals received for the 1996-2001 CRSP plan address the main areas of concern to aquaculture research and development. In keeping with USAID's strategic interest in targeting smallholder and small-scale commercial aquaculture, most of the 25 pre-proposals relate to adaptive and applied research in natural feeds, organic fertilizers, broodstock management, reproduction controls, information management, marketing, food security and a host of priorities related to diversifying rural economies.

Although most research will focus on freshwater systems, the CRSP will also investigate water quality issues in saline systems in Latin America, where commercial shrimp culture has amounted to a blue revolution of sorts. To complement the research agenda, a research support component, which was initiated this past year, will be expanded to include a greater emphasis on strengthening national institutions and increasing impact through training, information, networking, education, and policy analysis.

While there are many constraints facing aquaculture, there is no one constraint that can be singled out for its global importance. Rather, most

constraints depend on scale, temporality, system, stage of development, and context. For example, in southern Africa the optimization of fish productivity through pond fertilization and natural feeds has been identified by FAO as one of the top research priorities, whereas in Latin America, a key priority is pathology and disease prevention.

In a broad sense, certain general priorities appear often in the literature. Among these are:

- building national research systems by conducting collaborative research
- carrying out social sciences research especially in cases where aquaculture is being extended to new areas, and
- recognizing the importance of a systems approach, which in this sense refers to the interaction of the sociosphere and the technosphere.

In a critical analysis of research priorities undertaken this summer, the CRSP has been careful to articulate possible areas of donor cooperation. Coordinating efforts between the various international aquaculture research programs is not easy, however, given that goals of donor institutions differ and that proposed activities are often curtailed due to lack of funding. For example, ICLARM proposes general research themes that at first glance seem to overlap with CRSP research, but actually demand the collaboration of the hundreds of scientists active in the CRSP and other institutions. Without collaboration, no single institution is equipped with the staff or funding to carry out the types of research needed to strengthen national institutions, or to make a regional difference in optimizing extensive and semi-intensive aquaculture systems.

The CRSP planning process provided some unique opportunities to examine development trends in setting a long-term research agenda. A strategic planning session on social variables was held in conjunction with our 1994 Annual Meeting in Hawaii. Also at that meeting, a session was held to

highlight host country perspectives on key constraints, and expert working groups met to discuss research priorities in the areas of reproduction controls, pond inputs (feeds and fertilizers), appropriate technologies, socioeconomics, effluent quality and management, and species evaluation. A team met in Auburn, Alabama in June 1994 to re-align the research agenda to reflect the input of the working groups.

This re-aligned strategy then became the basis for the draft proposal which was submitted to USAID in January 1995. A second major revision of the plan followed from events, such as the comprehensive USAID/TR&D review of CRSPs, the tragedy of Rwanda and the search for new regional sites, input of the Technical Committee during the 1995 Annual Meeting, and changes within the USAID portfolio in fisheries and aquaculture. In this and in subsequent versions of the proposal, input reflecting the above events and additional information from ALCOM and FAO were incorporated.

The long process of developing a strategic research agenda around an examination of constraints will provide the CRSP a good foundation for its next five to ten years of work. In the strategic meeting in Washington, DC this past July, individuals from USAID, BIFAD, and CRSP discussed the reformation of CRSP advisory groups to enhance the relevancy of our research and improve overall program effectiveness. Our challenge is to build into our program an effective mechanism for periodic reassessment and realignment of our research—be it innovative, adaptive, or applied.



RWANDA REFUGEE RELIEF: CRSP TIES STILL STRONG

By J-J Newman

Thanks to the generous support we received from so many CRSP participants and others, the CRSP Rwanda Refugee Relief fund has been very successful in helping a number of our Rwandan co-workers during the troubled times since April 1994. With the financial and moral support provided by the fund, the majority of those who survived the slaughter have managed to find work and establish new lives.

Eugene Rurangwa is at the Catholic University of Leuven in Belgium where he is working on a PhD. All of his data were lost in the war, so he had to change topics and start completely over, but he recently reached the point where he can begin publishing. All three of his children are in Belgium, although they live in a group home during the week and only join Eugene on the weekends. Eugene has repeatedly told us how grateful he is for the help the fund has provided.

Patricie Nyirahabinka (wife of Jean-Damascene Bucyanayandi) and her three sons are *still* in Nairobi waiting for visas

from the Canadian High Commission. She has been promised a job at her alma mater in Canada and apparently has the support of immigration officials in Canada; the problem appears to be with the Nairobi office. She was recently told unofficially that there was no problem with her case, but that it will still be a few more months before the visas are issued. In the meantime, she has received a grant from Oxfam-Quebec to work on a project about Rwandan women, which should engage her until the end of the year.

Domitille Niyitigeka, her husband Etienne and their two children are sharing an apartment with Patricie and her kids (sounds pretty crowded!). Domitille has been working as a teacher for the children of some Burundians. Etienne has started a small typing business with a typewriter provided by Roelof Sikkens when he was in Nairobi last spring.

Marie-Louise Umugiraneza is working as a radio operator for the UNHCR in Butare (her English is now excellent!). She is very happy with her work, but is

having some serious problems with her heart as a result of her starvation last April and May (she weighed 30 kg when she was finally able to come out of hiding). She may need treatment in Belgium; we will try to help her if that becomes necessary.

Alexandre Gahigana is now the driver for the new Rector of the university. He and his wife had a baby girl this spring.

Many of the former station workers have returned and are working to bring the station back into production. More often than not they are paid with fish, but that's the whole idea, right?

Although the activity of the CRSP Rwanda Refugee Relief fund is greatly reduced these days, we are still maintaining contact with our former colleagues in Rwanda, Zaire, Kenya and elsewhere, and are still giving whatever assistance we can. If you wish to donate Delta Airlines frequent flier miles to help with the eventual travel of Patricie Nyirahabinka and family, email:

mcnamarm@ccmail.orst.edu or call Hillary Egna, 503 737-6415. Monetary contributions are still needed, and may be sent to:

CRSP Rwanda Refugee Relief
c/o J-J Newman
203 Swingle Hall
Dept. of Fisheries & Allied Aquacultures
Auburn University, AL 36849-5419

NEW THRUST FOR CAPACITY BUILDING

Although PD/A CRSP researchers have from the start of the program been active in providing informal training opportunities for students and aquaculturists, the PD/A CRSP has never had the funding to support formal training programs. Despite this constraint, the involvement of students from host countries and the U.S. has constituted an important part of the CRSP's support to aquaculture research. Informal training activities such as short courses and workshops are frequently conducted by CRSP researchers and visiting scientists. More than 400 individuals have benefited from these efforts worldwide. With the initiation of a new five-year plan, the CRSP will dedicate funding to increase the impact of CRSP research by engaging in an ambitious program of Human Resource Development.

The CRSP recognizes that the lack of appropriate education and training can hamper the quality of the research effort and create obstacles to the adoption of new technologies. Human resource devel-

opment, therefore, is an essential ingredient of a research and development program. In the CRSP continuation plan, human resource development will be integrated into the research program to provide scientific, technical, and managerial training to a wide spectrum of CRSP clients. Potential clients for CRSP training includes farmers, farm managers, government administrators and policy makers, graduate students, technicians, and researchers. CRSP training will be focused largely, though not exclusively, on host-country participants. The Management Entity will coordinate the Human Resource Development component, and draw on the technical expertise from appropriate CRSP institutions.

The "menu" of training activities available from the CRSP will include support for formal graduate degree training, short-term training courses, workshops, regional and international conferences, and distance learning activities.

MILESTONES

David Teichert-Coddington left Honduras with his family on 4 June 1995. Delia Martinez is running the Choluteca laboratory, and experimental work is being overseen by the producers of ANDAH and the Panamerican Agriculture School.

James Szyper has relocated from Thailand to the Hawaii Institute of Marine Biology.

C.K. Lin and Claude Boyd are serving as program chairmen for the 1996 World Aquaculture Society meeting in Bangkok, Thailand, to be held 29 January- 2 February 1996.

PD/A CRSP PROJECT REPORTS

CRSP activities for April through June 1995 are reported below. The CRSP Sixth and Seventh Work Plans provide detailed descriptions of the experiments referred to in the text. Work Plans may be ordered from the Management Office.

HONDURAS

Monitoring of estuarine water quality continues for the major estuaries of the shrimp production regions of southern Honduras to ascertain changes in water quality over time. Baseline water quality conditions were established as part of an earlier study.

A study of the relationships among stocking density, mean shrimp size, survival, and carrying capacity has been carried out during both the wet and dry seasons in Honduras. The goal of the study was to increase feeding efficiency while maintaining water quality. Researchers calculated chemical budgets for ponds stocked with different densities to determine ecological efficiency of intensification. Although studying the effects of Taura Syndrome was not part of the experimental design, circumstances allowed researchers to observe that effects of the Taura Syndrome were not intensified in the dry season and seemed unrelated to stocking densities of 6 to 8 shrimp/m². As usual, dry season production was about half of wet season production. During both seasons, production increased with stocking density. Economic returns during the wet season increased with stocking density, but the relationship was equivocal for the dry season.

Two students from the Panamerican Agriculture School at Zamorano began a study entitled "Effects of tides on nutrients, oxygen, temperature, and salinity profiles in two major shrimp producing estuaries of southern Honduras."

RWANDA

Researchers completed the second iteration of an experiment to determine the most effective lime requirement estimator for use in broadly different soil types. Analysis of soil samples from potential sites in Africa continued. Laboratory test-

ing of soils from Kenya and Rwanda was completed, and contacts were made to explore a potential site in Zimbabwe. Researchers also studied the appetite and growth responses of tilapia fry to different temperature regimes. A preliminary proposal for a cooperative effort with Belgium and Kenya at Sagana Fish Farm near Mt. Kenya was modified.

THAILAND AND THE PHILIPPINES

Researchers studied stocking density at high nutrient input levels to determine the effects of stocking density on pond carrying capacity, including fish size and total net yield, in fertilized ponds with supplemental feeding. The first experiment at the Huay Luang fisheries station in Udorn Thani province ended at harvest in April. The experiment evaluated the effects of fertilizer application frequency on the dynamics of rainfed ponds.

Data are being analysed for a study to determine whether caging tilapia for final growout can efficiently produce a limited number of large tilapia while utilizing the nutrients produced from feeding the caged tilapia to grow smaller tilapia.

Data are also being analyzed for a study to determine how the addition of common carp to a tilapia monoculture affects fish production, nutrient dynamics, turbidity, and primary productivity.

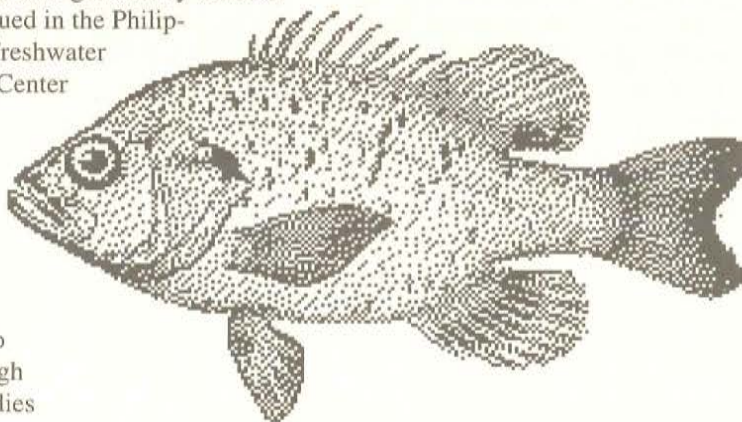
Yield trials with genetically selected tilapia continued in the Philippines at the Freshwater Aquaculture Center of Central Luzon State University (FAC/CLSU) and on nearby farms. Researchers also worked on high elevation studies

which were originally scheduled to be completed in the Rwanda project. Work began on the transition year studies of relationships to be found in the CRSP Data Base concerning primary production and fish yield.

DATA ANALYSIS AND SYNTHESIS

Results of respiration measurements and of primary production studies are being incorporated into the Water Quality/Fish Yield Model, and into the Integrated Agriculture-Aquaculture Model. Work continued on the temperature and dissolved oxygen model to adapt it to long-term simulations with stochastic weather values. These modifications, along with the introduction of internally calculated stochastic solar radiation values, result in a wider range of water temperatures and dissolved oxygen values. For example, water temperature values measured at two week intervals in Thailand fell within the range determined from temperature simulations obtained with the revised model. However, dissolved oxygen simulations still show poor fit to data in the long-term simulations. The reasons for the poor fit appear to be at least partly associated with the use of chlorophyll-*a* and Secchi disk depth values, which are available at two week intervals in the data set. The model will be modified to include the simulation of phytoplankton so that daily chlorophyll-*a* and Secchi disk depth can be estimated internally (within the model) rather than having to rely on values measured every two weeks.

The economic optimization component of *POND* is currently being developed. Typically, such optimization requires minimization or maximization of



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Registration fee of \$175 US is payable by bank draft to *POND Workshop* at time of registration. This fee includes the workshop, refreshments, *POND* software, hard copy and electronic version of the *Users' Guide to POND*, and the *POND* tutorial program. Upon receipt of your registration form and bank draft, you will be sent a confirmation advising you of workshop location. All workshops will be held adjacent to the main location of the World Aquaculture Society meeting.



To register, or for further information:

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an *objective* or *cost* function. The objective function chosen for facility-level economic optimization in *POND* is the *maximization of net returns* (calculated by enterprise budgeting) based on one or more of the following management strategies (as specified by the user): stocking densities and sizes, stocking/harvesting dates, species combinations, and fertilization, feeding, and water use rates. A facility configuration in *POND* is essentially a combination of these strategies. Optimization of the objective function will occur by the use of an iterative, genetic algorithm-based guided search that runs the simulation models in *POND* for each facility configuration, generates and evaluates enterprise budgets for each configuration, and selects configurations found to be more economically viable. This iterative process continues until no further improvement in the objective function is achieved (i.e., convergence to the most economically viable solution is reached).

The *POND User's Guide* has been updated for the next release of *POND*. The *User's Guide* also includes a detailed tutorial that documents the use of *POND* for decision support relevant to pond planning and management.

The Technical Manual for the new version of *POND* is in preparation. The manual documents the simulation models and economic analysis framework in *POND*. The manual will also describe the use of these analysis tools to examine effects of alternate pond management strategies on facility-level fish yields and economic returns. Management strategies that will be addressed in the manual include different rates of pond fertilization and supplementary feeding, fish stocking densities and sizes (under both monoculture and polyculture situations), different stocking and harvest dates, and water quality (See story on *POND* Workshop, p. 8).

Work continues on an integrated agriculture-aquaculture model focusing on nitrogen dynamics. The *POND* submodel of the integrated system makes use of formulations developed by the OSU and UCD/DAST teams. Work during this period concentrated on modeling feeding behaviors when multiple feed resources are available, and is based on the approach used in *POND*. Modifications to the approach used in *POND* include the

estimation of feed preference and uptake on the basis of actual feed intake, not maximum intake rate, and the use of N:C ratios in various feed sources as an indication of "feed quality".

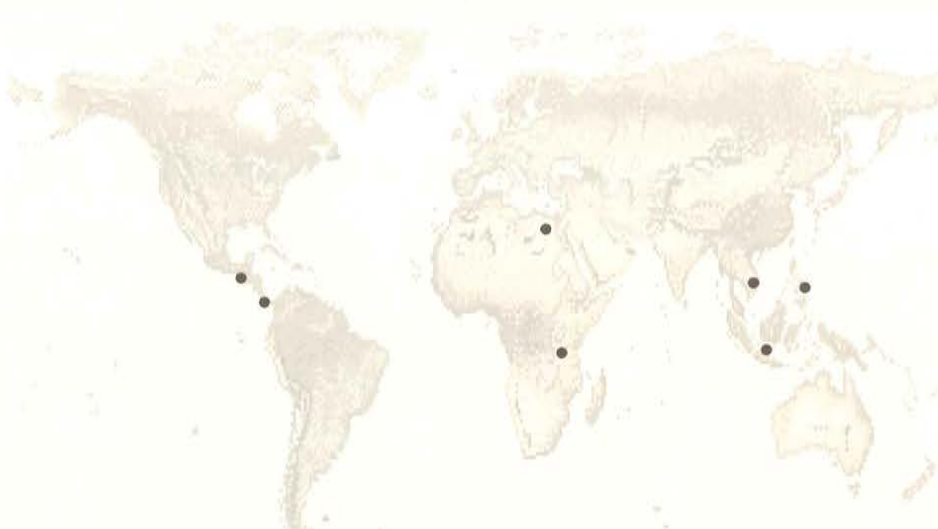
PROGRAM MANAGEMENT OFFICE

Highlights of Activities

- Hillary Egna participated in USAID's preliminary aquaculture strategy meeting at the Pacific Conference on Marine Science and Technology (PACON) Conference on Sustainable Aquaculture 95. Honolulu, Hawaii. 11-14 June 1995.
- Closed out Egypt project accounts and filed final reports with USAID/Cairo.
- Egna and Brigitte Goetze met with USAID project staff in Washington, DC to discuss the CRSP proposal process, and the one-year funded extension.
- Negotiated a one-year extension with USAID Contracts Office and prepared new budgets, Scope of Work, and other documents in response to changing USAID regulations.
- Provided leadership to the CRSP Technical Committee in coordinating the review of Work Plan and budgets for the

one-year extension.

- Revised the CRSP draft proposal and submitted it on 2 May 1995 to USAID Global Bureau staff for internal review.
- Egna presented a seminar on Constraints in International Aquaculture to Wayne Seim's class in the Department of Fisheries and Wildlife.
- Organized and participated in the Board meeting held by conference call on 27 April. Prepared and distributed the minutes of this meeting.
- Participated in the CRSP Council Conference call on 8 June 1995.
- Provided leadership for planning for new site selection by identifying site selection criteria and forming a working group.
- Distributed the Twelfth Annual Administrative Report and Twelfth Annual Technical Report of the PD/A CRSP.
- Began planning for the Fourteenth PD/A CRSP Annual Meeting, to be held 26-28 January 1996 in Bangkok, Thailand, in conjunction with the World Aquaculture Society meeting.
- Prepared a response to the final version of Tropical Research & Development's final report, *An Evaluation of the USAID and Universities Collaborative Research Support Programs*.
- Goetze participated in a research administration workshop sponsored by Oregon Research Administrators.
- Coordinated the review process for incoming chapters of the CRSP book.



- The CRSP presently conducts research in Honduras, Thailand, and the Philippines. Past research sites include Egypt, Indonesia, Panama, and Rwanda.

CRSPs EXPLORE REGIONAL APPROACH TO COLLABORATION

By Brigitte Goetze

The CRSPs have improved food security and stimulated economic growth through agricultural research, technology development and transfer, and human capacity development worldwide. The need to use resources more efficiently stimulated USAID and the CRSPs to explore how best to employ the combined strengths of the CRSPs. Under the guidance of the CRSP Council and USAID, the CRSPs started to develop a regional approach to natural resource management in West Africa, an area in which currently six different CRSPs are active. This is the first time that the CRSPs have pooled their resources toward a common goal and are establishing a model for future inter-CRSP activities.

This initiative is guided by the notion that the sustainable use of natural resources entails increased agricultural productivity. Land-use decisions are made by farmers, herders, woodcutters and others. Preventing natural resource degradation and ensuring sustainable use affects these land-use decisions. The fundamental concept is that unless environmental sustainability becomes a joint undertaking of all concerned, agricultural productivity will not be sustainable.

To further the development of this activity, the directors and deputy directors of the CRSPs met with USAID Africa Bureau personnel in Washington DC in August. They produced an agenda for a regional workshop to be held on 18-22 September 1995 in Niamey, Niger, with the charge of creating a work plan for collaborative activities for West Africa. The specific objectives of this workshop are to:

1. Create a common base of understanding across CRSPs, including technologies that have been developed and the current and potential impacts of those technologies in the region.
2. Identify priority constraints to natural resource management.
3. Plan technology transfer to apply available technologies, and research activities to develop or adapt technologies for priority constraints.
4. Establish linkages among research, extension, and NGO/PVO organizations active in West Africa.

The workshop will give researchers, administrators, and farmers from different West African countries the opportunity to communicate their needs to CRSP representatives and to inform themselves about the CRSPs.

OSU HOSTS SEMINARS

Dr. Randall Brummett presented a seminar on small-scale rainfed aquaculture in Malawi at OSU last June. Brummett, from the International Center for Living Aquatic Resources Management (ICLARM), has helped develop subsistence-level integrated agriculture-aquaculture systems in Southern Africa for several years. He focused on the technical and economic feasibility of rainfed aquaculture in Malawi, as well as on the close interaction between farmers and researchers in the development of appropriate agriculture-aquaculture technologies. Brummett and the CRSP researchers in attendance identified opportunities for potential collaboration between the CRSP and ICLARM in the Malawi aquaculture program.

Kelly Kammerer, Counselor for USAID, identified the goals, impact, and benefits to Oregon of the U.S. foreign assistance program at an OSU seminar in June. He discussed the over \$45 million in on-going USAID grants and contracts in Oregon, which includes the funding of the PD/A CRSP, as well as contracts and grants for technical assistance, supplies and agricultural products. Discussion focused on the economic benefits that accrue to Oregon in the form of jobs as a result of U.S. foreign assistance, the congressional debate on budget cuts, and possible effects on foreign assistance programs.

SETTING RESEARCH PRIORITIES

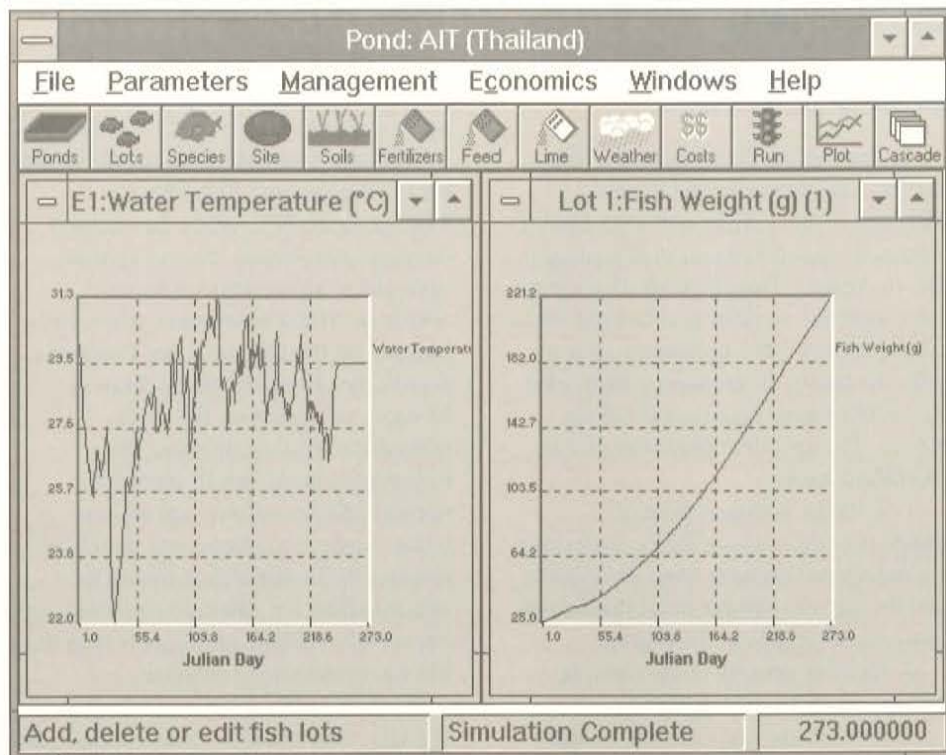
By Martin Fitzpatrick

Where should PD/A CRSP research focus? How is aquaculture development constrained and how can research help to overcome these restraints? These are some of the questions facing the PD/A CRSP (see H. Egna, this issue) as it prepares its Continuation Proposal. With this in mind, the CRSP Board of Directors authorized a meeting to be held on one of the Research Topic areas agreed to at the 1994 CRSP Annual Meeting in Hawaii. Martin Fitzpatrick agreed to coordinate the meeting in late August 1995 on Reproduction Control Studies with the help of CRSP Deputy Director Brigitte Goetze, but found that the other CRSP scientists in this area were unable to travel to Corvallis to attend the meeting. What could be done?

Enter the information superhighway. Fitzpatrick has been soliciting information from those investigators by email, fax, and phone. Instead of meeting together, the CRSP researchers received by email an agenda and instructions on the type of information that would be useful. CRSP investigators were asked to discuss if reproduction control fits within the major constraints to aquaculture, identify the type of research in reproduction control being funded by other donors, and to justify the research topics in reproduction control that had been submitted as preproposals prior to the Hawaii annual meeting.

In addition, Fitzpatrick wrote a survey based on the research topics in the Reproduction Control Studies section and sent

it to about 50 scientists all over the world in the hope of clarifying whether the CRSP is on the right track in developing research strategies in reproduction control. The survey broke the Reproduction Control section of the proposal into nine research topics and asked survey participants to rank them as "very important," "important," or "not important" in overcoming major constraints to aquaculture in the various regions of the world (including the US) and in extensive, semi-intensive, and intensive production systems. At press time, responses to the survey were still coming in to Fitzpatrick. Perhaps this use of the information superhighway will become a model for future CRSP planning exercises. Stay tuned (or online).



A sample screen from the most recent version of *POND*, the decision support system developed by the OSU/DAST. The DAST workshop offered by the CRSP in Bangkok will introduce *POND* to aquaculturists planning or managing facilities around the world.

POND® WORKSHOP TO BE HELD IN BANGKOK

By Shree Nath

The OSU/DAST will conduct a comprehensive workshop on *POND*, the decision support system developed by the CRSP. The workshop will be held in conjunction with the forthcoming World Aquaculture Society meeting in Bangkok, Thailand. Announcements of the workshop were recently sent to the World Aquaculture Society mailing list, to elicit participation from aquaculturists around the world. The workshop will be held 29 January 1996, and will introduce participants to the capabilities of decision support software.

Participants will assess the effects of various management decisions (e.g., site locations, fish species for culture, stocking densities, feeding rates, fertilization and liming rates, and water exchange rates) on pond performance and facility-level economics. Computers will be available during the workshop for participants to work with the software.

The workshop fee of \$175 US includes workshop presentations, hands-on practice sessions using *POND*,

refreshments, take-home copies of the *POND* software, hard copy and diskette copy of the *POND User's Guide* and the *POND* software tutorial. To register, fill out and mail the workshop registration form included in this issue of *Aquanews*, along with a bank draft of \$175. For further information about the workshop, please contact:

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CRSP AND FAO TO COLLABORATE ON GIS STUDY

By Shree Nath

A collaborative effort between FAO and OSU/DAST researchers is currently underway to estimate the potential for subsistence and commercial fish farming in the fresh waters of Latin America. The intent of this study is to stimulate improved planning for aquaculture development at national levels and to provide a tool for use in technical assistance activities. Geographical Information Systems (GIS) will be used to organize, manipulate, and present spatial data relevant to the analysis.

Certain types of spatial data (e.g., soil type, elevation, and population density) will be directly entered into the GIS. Other spatial data required for the study will be generated by the use of models. For instance, time-series weather data provided by the FAO will be used to generate fish growth progress by the use of *POND* models.

For further information about this collaborative effort, please contact:

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FAO, Via delle Terme di Caracalla
00100 Rome, Italy
E-mail: Jim.Kapetsky@fao.org
-or-
John Bolte or Shree Nath
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PD/A CRSP ACTIVE IN ORGANIZATION OF SHRIMP SYMPOSIUM

CRSP researcher David Teichert-Coddington was instrumental in organizing the Third Central American Shrimp Symposium, held in Tegucigalpa, Honduras last April. Teichert-Coddington worked with ANDAH, the local producers group, to organize the symposium, which attracted over 300 participants. For further information, contact Teichert-Coddington at Auburn University.

CRSP PRESENTORS AT PACON

The Pacific Conference on Marine Science and Technology (PACON) Conference on Sustainable Aquaculture was held 11-14 June 1995 in Honolulu, Hawaii. The following papers were presented by CRSP researchers:

Claude Boyd. Source Water, Soil, and Water Quality Impacts on Sustainability in Aquaculture.

Shree Nath, John Bolte, and Doug Ernst. Decision Support for Pond Aquaculture Planning and Management.

Thomas Popma, Ronald Phelps, Silvanía Castillo, L. Hatch, and Terrill Hanson. Family-scale Fish Farming in Guatemala: An Example of Sustainable Aquacultural Development through National and International Collaboration. Presented by Bryan Duncan.

James Szyper, C. Lin, David Little, Amararatne Yakupitiyage, and Sununtar Sethboonsarng. Techniques for Efficient and Sustainable Mass Production of Tilapia in Thailand.

Karen Veverica, Wayne Seim, Thomas Popma, and Eugene Rurangwa. Cut Grass as Fertilizer for Tilapia Ponds: Composting Methods, Application Rates, and Timing.

David Teichert-Coddington. Pond Management, Estuarine Water Quality, and Sustainable Shrimp Culture in Central America. Presented by Claude Boyd.

Bytes from THE ELECTRONIC POND

Electronic communications present an opportunity to disseminate information quickly and cheaply. Since aquaculture research is in its infancy compared to agricultural research, any tool that helps us "get the word out" more efficiently and effectively is highly valuable. Quite possibly, cheap and ubiquitous electronic access to information will allow aquaculture research to "leapfrog" earlier stages of information dissemination, and bring research results to the end users much more quickly. To this end, the CRSP is currently reorganizing its information management by emphasizing on-line access. While that process is underway, this column will point out a few resources that are available for those of you already hooked up to the Information Superhighway. Look to future columns for interesting "fishy" sites.

AquaNIC (Accessing Aquaculture Information Through the Aquaculture Network Information Center) is a gateway to the world's electronic resources in aquaculture, a multi-branched system containing a wide variety of information. Most documents can either be viewed on your computer monitor, downloaded via modem, or a copy sent to your e-mail address. AquaNIC also contains an image directory that holds hundreds of pictures, short videos, and slides in a variety of common image formats.

AquaNIC is linked to other databases on the Internet, and may be searched us-

ing a search engine called "jughead". AquaNIC utilizes both a Gopher server and a WWW server both located at The Libraries of Purdue University. AquaNIC is also linked to an Almanac server in Purdue University Cooperative Extension Service. Any of the following methods may be used to access AquaNIC.

•World Wide Web: If you are running your own WWW client (Mosaic, Netscape, etc.) the proper URL is: <http://thorplus.lib.purdue.edu/AquaNIC/>

•Gopher: If you are running your own gopher client, the proper URL is: <gopher://thorplus.lib.purdue.edu:11/databases/AquaNIC>

If your institution uses a Gopher server, follow these steps—Locate: United States Gopher servers→Indiana Gopher servers→Purdue University Gopher servers→Libraries of Purdue University Gopher servers→Scholarly Databases→AquaNIC.

•Telnet: telnet to lib.purdue.edu. When prompted for a login, enter lynx. From the list of 10 menu items, choose Purdue University databases.

•Almanac: AquaNIC information can be requested by email using Almanac. The email address is: almanac@ecn.purdue.edu. In the body of the text leave a blank line. Then type the following line: send aquanic catalog. A catalog will be sent to you electronically. Requests can then be made by following the instructions in the catalog.

CRSP PUBLICATIONS – HOT OFF THE PRESS

The following publications are now available from the Program Management Office. To request a copy of a publication, or to receive a Publication Order Form, write:

PD/A CRSP Publications
Snell Hall 400
Oregon State University
Corvallis, OR 97331-1541

Egna, H., J. Bowman, B. Goetze, and N. Weidner. Twelfth Annual Technical Report. 209 p.

Egna, H., M. McNamara, N. Weidner. Twelfth Annual Administrative Report. 95 p.

Goetze, B., H. Berkman, and H. Egna.

Egypt Project Pond Dynamics/Aquaculture Collaborative Research Support Program Final Report: October 1992-March 1995. 30 p.

PD/A CRSP Quarterly Report January-March 1995.

In addition to the reports published by the Program Office, other publications related to PD/A CRSP research are available directly from researchers. Inquiries about the following publications

can be made to the author(s).

Boyd, C.E. 1995. Bottom Soils, Sediment, and Pond Aquaculture. Chapman & Hall. New York, NY 10009.

Egna, H. 1994. Monitoring water quality for tropical freshwater fisheries and aquaculture: a review of aircraft and satellite imagery applications. *Fisheries Management and Ecology* 1:165-178.

Egna, H. 1995. Psychological distress as a factor in environmental impact assessment. *Environmental Impact Assessment Review*. 12:115-137.

BIFAD MEMBERS APPOINTED

The appointment of the final member of the Board of International Food and Development (BIFAD) means that the PD/A CRSP Continuation Proposal can be reviewed this fall. This seven-member Board advises the Administrator of USAID on international food security issues and other matters pertaining to the U.S. foreign assistance programs, including recommending the funding of proposals that address food security.

Members of the Board include:

- Ada Demb, Associate Professor of Education at Ohio State University;

- Walter Falcon, Director of Stanford's Institute for International Studies;

- Miles Goggans, current president of the agricultural and timber consulting and trading firm, Goggans, Inc., previously assistant to the President for Agriculture, Trade, and Rural Affairs;

- Walter Hill, Dean and Director of the School of Agriculture and Home Economics at Tuskegee University;

- Alan Kligerman, founder and CEO of Lactaid, Inc. and a member of the Advisory Council of Cornell's Institute of Food Science;

- Edward Schuh, Dean of the Humphrey Institute of Public Affairs at the University of Minnesota and former Director of Agriculture and Rural Development at the World Bank;

- Goro Uehara, professor of agronomy at University of Hawaii.

The PD/A CRSP joins USAID in welcoming the distinguished members of this board. The breadth and depth of their experience in both the public and private sector should add to the rigor and usefulness of the review process.

MEETINGS AND WORKSHOPS

Annual Meeting of Seafood and Technology Society of the Americas, 5-8 November 1995, Palmas Del Mar Resort, Humaco, Puerto Rico. Contact Steve Otwell. Phone: (904) 392-8594; email: otwell@gnv.ifas.ufl.edu.

PD/A CRSP Annual Meeting, 26-28 January 1996, Asian Institute of Technology, Bangkok, Thailand. Contact Marion McNamara, Snell Hall 417, Oregon State University, Corvallis, OR 97331-1641 USA. Phone: (503) 737-6419; Fax: (503) 737-3447; email: mcnamarm@ccmail.orst.edu

World Aquaculture '96, The Annual Conference and Exposition of The World Aquaculture Society, 30 January- 2 February 1996, Bangkok, Thailand Contact Conference

Manager, Sea Fare Expositions, Inc. 850 NW 45th St., Seattle, WA 98107. Phone (206) 547-6030; Fax: (206) 548-9346.

Bordeaux Aquaculture '96 International Conference and Exhibition, 20-22 March 1996, Bordeaux Lac-France. Contact BCS, Palais des Congres, 33300 Bordeaux Lac, France. Phone: 33 56 11 88 88; Fax: 33 56 43 17 76.

Final Workshop on the Aquaculture Sustainability and Environment Study, 3-9 October 1995, Beijing, China. Contact Network of Aquaculture Centres in Asia-Pacific, P.O. Box 1040, Kasetsart Post Office, Bangkok 10903, Thailand. Phone: 011/662-561-1728.

Aquaculture America '96 National Conference and Exposition, 14-17 February 1996, Arlington Convention Center, Arlington, Texas, USA. Contact Aquaculture Americas, c/o Sea Fare Expositions, Inc., 850 NW 45th Street, Seattle, WA 98107. Phone: (206)547-6030.

International Symposium and Workshop on Stocking and Introduction of Fish in Freshwater and Marine Ecosystems, 25-29 March 1996, Hull, United Kingdom. Contact Dr. I.G. Cowx, The University of Hull, International Fisheries Institute, Hull HU6 7RX, United Kingdom. Phone: 01482 466421; Fax: 01482 470129.

AQUANEWS

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Published quarterly by the Program Management Office, Pond Dynamics/Aquaculture Collaborative Research Support Program, Office of International Research & Development, Snell Hall, Oregon State University, Corvallis, Oregon, 97331-1641.

The Pond Dynamics/Aquaculture Collaborative Research Support Program is supported by the U.S. Agency for International Development under CRSP Grant No.: DAN-4023-G-00-0031-00.

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