



# Final Report of the Aquaculture Collaborative Research Support Program: 1996 to 2008 Volume 2

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## Acknowledgments

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**AQUACULTURE COLLABORATIVE RESEARCH SUPPORT PROGRAM**  
**Final Report: 1996 to 2008**  
**Volume 2**

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## APPENDIX 1. INVESTIGATIONS SUMMARY & ASSESSMENT

Aquaculture CRSP research and outreach investigations conducted under the 8<sup>th</sup> to 12<sup>th</sup> Work Plans during the period 1996 through 2008 and funded under USAID Grant LAG-G-00-96-90015-00.

Code <sup>1</sup>	Study Title	Lead US PI <sup>2</sup>	US Institution	Final Status <sup>3</sup>	Comment or Modification Reference <sup>4</sup>
<b>8th Work Plan</b>					
8ADR1	Socioeconomic Dimensions of Aquaculture Development: Baseline Conditions, Human Capital Impacts, and Technology Diffusion Processes	Molnar	Auburn University	2	2nd Addendum to the 8th Work Plan: new work plan for 3 studies coded 8ADR1-1, 8ADR1-2, and 8ADR1-3.
8ADR1A	Tilapia Producer Perceptions and Practices in Five PD/A CRSP Countries	Molnar	Auburn University	2	Progress Report for original 8ADR1, under a revised title.
8ADR1-1	Fish Culture in the Peruvian Amazon: Producer Perceptions and Practices in Three River Systems	Molnar	Auburn University	2	See 8ADR1. Revised title.

<sup>1</sup> Codes identify each investigation with a unique number associated with the Work Plan and scientific theme under which the investigation was conducted. Code assignments follow a uniform format. Using the code 8ADR1 as an example: "8" refers the 8<sup>th</sup> Work Plan, "ADR" is the acronym for the "Adoption & Diffusion Research" scientific theme, and "1" is the sequential investigation number assigned within the scientific theme block. See Appendix 3 for a listing of scientific themes and their acronyms and Volume I (*Introduction*) for definitions. Missing numbers in the coding sequence are for investigations that were assigned a code prior to proposal review and were unsuccessful in receiving funding. In some cases, investigations were added or modified after publication of the Work Plan. For these investigations, work plan details are available in the subcontract or MoU.

<sup>2</sup> The Lead US PI may or may not have been listed as the first author on the reports submitted for the investigation.

<sup>3</sup> 1 = Successfully Completed; 2 = Successfully Completed in Part or with Modification; 3 = Suspended

<sup>4</sup> Addenda are cited when an investigation work plan was revised or a new investigation was introduced. Subcontracts or MoUs are noted when either revised or new investigation work plans were developed after publication of the Work Plan or its addenda.

**AAR** = Annual Administrative Report covering administrative reporting on the projects; **ATR** = Annual Technical Report presenting detailed summaries of investigation goals, methodologies, findings, and benefits. The ten-year report series covering volumes 16 to 25 includes a separate AAR and ATR for each year, e.g., 16AAR and 16ATR for the period 1 August 1997 to 31 July 1998. For volume 20, only an AAR was published.

Code <sup>1</sup>	Study Title	Lead US PI <sup>2</sup>	US Institution	Final Status <sup>3</sup>	Comment or Modification Reference <sup>4</sup>
8ADR1-2	Sources of Technical Assistance for Fish Farmers in the Peruvian Amazon	Molnar	Auburn University	2	See 8ADR1. Revised title
8ADR1-3	Identifying Goals and Priorities of Fish Farmers in the Peruvian Amazon	Molnar	Auburn University	2	See 8ADR1. Revised title
8ADR2	The Influence of Fish Culture Technology, Extension Methodology, and Socioeconomics on Success of Fish Culture on Limited-Resource Farms	Lovshin	Auburn University	2	2nd Addendum to the 8th Work Plan. Final Technical Report under new title: "Impacts of Integrated fish Culture on Resource-Limited Farms in Guatemala and Panama: An Ex-post Evaluation".
8ASMR1	Aquaculture Systems Modeling for the Analysis of Environmental Impacts and Integration with Agriculture	Piedrahita	University of California	1	2 separate studies: 8ASMR1A and 8ASMR1B.
8ASMR1A	Aquaculture Systems Modeling for the Analysis of Environmental Impacts and Integration with Agriculture: Relationship between Carbon Input and Sediment Quality in Aquaculture Ponds	Piedrahita	University of California	2	2nd Addendum to the 8th Work Plan
8ASMR1B	Aquaculture Systems Modeling for the Analysis of Environmental Impacts and Integration with Agriculture: Stochastic Modeling of Temperature, Dissolved Oxygen and Fish Growth Rate in Aquaculture Ponds	Piedrahita	University of California	2	2nd Addendum to the 8th Work Plan
8DM1	PD/A CRSP Central Database Management and Development	Bolte	Oregon State University	1	Work plan in MoU.
8DSSR1	Decision Support for Aquaculture Systems	Bolte	Oregon State University	1	Work plan with 4 parts in MoU.

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8DSSR1A	Decision Support for Aquaculture Systems: A Pond Sediment-Water Column Model for Phosphorus Cycling	Bolte	Oregon State University	2	Grouped with 8DSSR1B and 8DSSR1D; reported in 15ATR under title: "Advances in the POND® Software: Wizard Development and Model Refinements". Grouped with 8DSSR1B & 8DSSR1C and reported in 16ATR under title: "POND® Software Development and Refinement"
8DSSR1B	Decision Support for Aquaculture Systems: Models for Heterotrophic Dynamics and Polyculture Species Interactions in Ponds	Bolte	Oregon State University	2	See 8DSSR1A
8DSSR1C	Decision Support for Aquaculture Systems: Application of POND® Models for Optimization of Pond Facilities Based on Economic Performance and Environmental Impact Constraints	Bolte	Oregon State University	2	See 8DSSR1A. Reported in 15 ATR under the title: "Application of Systems Models for Evaluation and Optimization of Pond Management Practices"
8DSSR1D	Decision Support for Aquaculture Systems: Macro-Level Agroecological Systems Analysis and Socioeconomics of Pond Aquaculture	Bolte	Oregon State University	2	See 8DSSR1A
8FFR1	Global Experiment: Optimization of Nitrogen Fertilization Rate in Freshwater Tilapia Production Ponds	Boyd	Auburn University	2	1st, 2nd, and 3rd Addenda to the 8 <sup>th</sup> Work Plan: split into 4 investigations by country.
8FFR1H	Global Experiment: Optimization of Nitrogen Fertilization Rate in Freshwater Tilapia Production Ponds (Honduras Research)	Boyd	Auburn University	2	1st Addendum to the 8th Work Plan
8FFR1K	Global Experiment: Optimization of Nitrogen Fertilization Rate in Freshwater Tilapia Production Ponds (Kenya Research)	Veverica	Auburn University	2	1st and 2nd Addenda to the 8th Work Plan

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8FFR1Ph	Global Experiment: Optimization of Nitrogen Fertilization Rate in Freshwater Tilapia Production Ponds (Philippines Research)	Brown	Florida International University	2	2nd and 3rd Addenda to the 8th Work Plan
8FFR1T	Global Experiment: Optimization of Nitrogen Fertilization Rate in Freshwater Tilapia Production Ponds (Thailand Research)	Diana	University of Michigan	2	2nd Addendum to the 8th Work Plan.
8HCD1	Annual Activities of the Education Development Component	McNamara	Oregon State University	1	Work plan in MoU with 12 activities: 8HCD1A to 8HCD1L.
8HCD1A	Annual Activities of the Education Development Component: Establish an Education Advisory Panel in Each Country in which the CRSP Works	McNamara	Oregon State University	1	
8HCD1B	Annual Activities of the Education Development Component: Create a CRSP Fellowship Program to Provide Appropriate Support for Graduate-Level Students at Each CRSP Host Country Site	McNamara	Oregon State University	2	Progress Report in 17AAR. Fellowship award research continued as 9ERA4.
8HCD1C	Annual Activities of the Education Development Component: Identify Educational Opportunities Offered by Governments, Foundations, Other Donors	McNamara	Oregon State University	1	
8HCD1D	Annual Activities of the Education Development Component: Coordinate Evaluation of CRSP-Sponsored Short Courses and Workshops	McNamara	Oregon State University	1	
8HCD1E	Annual Activities of the Education Development Component: Serve as the CRSP Link to the Planning Committee for ISTA IV	McNamara	Oregon State University	1	



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8HCD1F	Annual Activities of the Education Development Component: Maintain and Improve the Database of CRSP Education and Training Alumni	McNamara	Oregon State University	1	
8HCD1G	Annual Activities of the Education Development Component: Provide Travel Support for Station Managers from CRSP Host Countries to Attend a Training Workshop in the U.S.	McNamara	Oregon State University	1	
8HCD1H	Annual Activities of the Education Development Component: Create and Maintain a Web Page Linked to the PD/ A CRSP Page	McNamara	Oregon State University	1	
8HCD1I	Annual Activities of the Education Development Component: Establish a Library of Information on CRSP Institutions	McNamara	Oregon State University	1	
8HCD1J	Annual Activities of the Education Development Component: Seek External Support for Additional Activities of Follow-on ISTA IV	McNamara	Oregon State University	1	
8HCD1K	Annual Activities of the Education Development Component: Work with Institutions in CRSP Host Countries to Seek Additional Scholarship Funding from Government Agencies, Foundations, and the Private Sector to Support Masters and Doctoral Students	McNamara	Oregon State University	1	
8HCD1L	Annual Activities of the Education Development Component: Seek External Support for a Station Manager Workshop to Be Held in the U.S.	McNamara	Oregon State University	1	

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8HR1	Intensification of Tilapia Production: Effects of Feeding at Different Stocking Rate on Pond Water Quality	Boyd	Auburn University	2	1st and 2nd Addenda to the 8th Work Plan
8HR2	Estuarine Water Quality Monitoring and Estuarine Carrying Capacity	Boyd	Auburn University	2	1st Addendum to the 8th Work Plan. Final Technical Report split into 2 parts by objectives.
8HR2-1	Estuarine Water Quality Monitoring and Estuarine Carrying Capacity	Boyd	Auburn University	2	1st Addendum to the 8th Work Plan. Objective 1 in Final Technical Report.
8HR2-2	Evaluation of Shrimp Farming Impacts in Golfo de Fonseca Region, Honduras	Boyd	Auburn University	2	1st Addendum to the 8th Work Plan. Objective 2 in Final Technical Report.
8HR3	Influence of Daily Water Exchange Volume on Water Quality and Shrimp Production	Boyd	Auburn University	2	1st Addendum to the 8th Work Plan
8HR4	Water Exchange to Rectify Low Dissolved Oxygen	Boyd	Auburn University	2	1st and 2nd Addenda to the 8th Work Plan
8IMNC1	Report: Annual Activities of the Information Management and Networking Component	Clair	Oregon State University	1	Work plan in MoU.
8KR1	New Site Development and Characterization	Veverica	Auburn University	2	1st Addendum to the 8th Work Plan
8KR2	Strain Variations in Sex Ratio Inheritance	Phelps	Auburn University	3	1st and 2nd Addenda to the 8th Work Plan. Tilapia strains found to be contaminated. Cancelled.
8KR3	Relative Contribution of Supplemental Feed and Inorganic Fertilizers in Semi-Intensive Tilapia Production	Veverica	Auburn University	2	1st Addendum to the 8th Work Plan.
8KR3A	Nutritional Contribution of Natural and Supplemental Foods for Nile Tilapia: Stable Carbon Isotope Analysis	Lochman	University of Arkansas at Pine Bluff	2	1st Addendum to the 8th Work Plan.

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8KR4	Training	Veverica	Auburn University	1	
8KR5	Regional Outreach in Africa	Langdon	Oregon State University	2	1st Addendum to the 8th Work Plan.
8MEAR1	Economic and Social Returns to Technology and Investment	Engle	University of Arkansas at Pine Bluff	2	2nd and 3rd Addenda to the 8th Work Plan. Combined with 8MEAR2 in the Final Technical Report.
8MEAR2	Risk Analysis of Pond Management Strategies	Engle	University of Arkansas at Pine Bluff	2	2nd and 3rd Addenda to the 8th Work Plan. See 8MEAR1.
8PDR1	Pond Soil Characteristics and Dynamics of Soil Organic Matter and Nutrients	Boyd	Auburn University	2	1st Addendum to the 8th Work Plan.
8PHR1	Development of Low Cost Supplemental Feeds for Tilapia in Pond and Cage Culture	Fitzsimmons	University of Arizona	1	Progress Report in 16ATR satisfied final report requirements.
8PR1	Development of Sustainable Pond Aquaculture Practices for <i>Colossoma macropomum</i> and/or <i>Piaractus spp.</i> in the Peruvian Amazon	Kohler	Southern Illinois University at Carbondale	2	1st Addendum to the 8th Work Plan.
8PR2	New Site Development and Characterization—Peru	Kohler	Southern Illinois University at Carbondale	1	2nd Addendum to the 8th Work Plan.
8RCR1	Monosex Tilapia Production through Androgenesis	Phelps	Auburn University	1	Split into 4 investigations.
8RCR1A	Monosex Tilapia Production through Androgenesis: Methods for Strain Variations in Sex Ratio Inheritance	Phelps	Auburn University	2	1st and 3rd Addenda to the 8th Work Plan; Progress Report in 16ATR. See 8RCR1D.
8RCR1B	Monosex Tilapia Production through Androgenesis: Methods for Androgenesis Techniques Applicable to	Shelton	University of Oklahoma	2	1st Addendum to the 8th Work Plan.

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	Tilapia				
8RCR1C	Monosex Tilapia Production through Androgenesis: Methods for Contribution from the Male and Female Genome to Sex Inheritance	Phelps	Auburn University	2	1st and 3rd Addenda to the 8th Work Plan.
8RCR1D	Monosex Tilapia Production through Androgenesis: Methods for Development of YY Lines of Males and Female <i>O. niloticus</i>	Phelps	Auburn University	3	1st and 3rd Addenda to the 8th Work Plan. No strain evaluated in 8RCR1A had a high enough percentage of spawns conforming to a 50:50 sex ratio to justify its use in 8RCR1D. Cancelled.
8RCR2	Steroid Immersion for Masculinization of Tilapia	Schreck	Oregon State University	1	Split into 3 investigations.
8RCR2A	Steroid Immersion for Masculinization of Tilapia: Immersion of Tilapia Fry in MDHT	Schreck	Oregon State University	2	1st Addendum to the 8th Work Plan
8RCR2B	Steroid Immersion for Masculinization of Tilapia: Effect of Fish Density on Efficacy of Masculinization by Immersion in MDHT	Schreck	Oregon State University	2	1st Addendum to the 8th Work Plan
8RCR2C	Steroid Immersion for Masculinization of Tilapia: Masculinization of Tilapia Fry by Immersion in MDHT at a Production Level	Phelps	Auburn University	1	
8RCR3	Detection of Masculinizing Agents in the Pond Environment	Schreck	Oregon State University	1	Split into 2 investigations.
8RCR3A	Detection of Masculinizing Agents in the Pond Environment: Detection of MT in Aquarium Water after Treatment with MT Food	Schreck	Oregon State University	2	1st Addendum to the 8th Work Plan
8RCR3B	Detection of Masculinizing Agents in the Pond Environment: Detection of MT in Pond Water after Treatment with MT Food	Phelps	Auburn University	2	2nd Addendum to the 8th Work Plan.
8TR1	Effects of Mud Turbidity on Fertilization, and an Analysis of Techniques to Mitigate Turbidity Problems	Diana	University of Michigan	2	1st Addendum to the 8th Work Plan

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8TR2	Management of Organic Matter and Nutrient Regeneration in Pond Bottoms Thailand	Diana	University of Michigan	2	1st Addendum to the 8th Work Plan
8TR3	Management to Minimize the Environmental Impacts of Pond Draining	Diana	University of Michigan	2	1st Addendum to the 8th Work Plan; revised title for Final Technical Report.
8TR4	Technical Transfer from On-Station Research to Producers	Diana	University of Michigan	1	Final Technical Report submitted under the title: "High-Input Green Water On-Farm Trials in Northeast Thailand".
<b>9<sup>th</sup> Work Plan</b>					
9ADR3	Aquaculture Training for Kenyan Fisheries officers and University Students	Veverica	Auburn University	2	Addendum to the 9th Work Plan. Erroneously listed as 10ADR1 in the Table of Contents for 21 ATR.
9ADR4	Establishment of Companion Sites in the Africa Region	Langdon	Oregon State University	2	MoU added supplementary investigations.
9ADR4A	Effect of Stocking Size and Nutrient Inputs on Productivity of <i>Oreochromis shiranus</i> in Ponds	Langdon	Oregon State University	2	See 9ADR4. Revised title.
9ADR4B	Studies on Potential Use of Salinity to Increase Growth of Tilapia in Aquaculture in Malawi	Langdon	Oregon State University	2	See 9ADR4. Revised title.
9ADR5	Regional Outreach in Africa	Veverica	Auburn University	1	
9ADR6	Workshops and Production of Improved Extension Materials	Brown	Florida International University	2	No Report. See 9ADR6B.
9ADR6A	Workshops and Production of Improved Extension Materials	Brown	Florida International University	1	Final Report for workshop built on 9FFR4.

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9ADR6B	Production of Improved Extension Materials	Brown	Florida International University	1	Addendum to the 9th Work Plan. Replaced Objective 2 of 9ADR6.
9ADR7	Decision Support for Policy Development: Planning Conferences for Collaborating Researchers, Public Agencies, and Nongovernmental Organizations Working in Aquaculture	Verma	University of Georgia	1	Addendum to the 9th Work Plan.
9ADR8	Production Strategies Characterizing Small- and Medium-Scale Tilapia Farms: Approaches, Barriers, and Needs	Molnar	Auburn University	1	Addendum to the 9th Work Plan.
9ADR9	Technical Assistance for Fingerling Production Serving Small- and Medium-Scale Tilapia Producers	Popma	Auburn University	2	Addendum to the 9th Work Plan. See 9ADR10.
9ADR10	Training and Technical Assistance for Honduras Institutions Working with Small- and Medium-Scale Tilapia Producers	Popma	Auburn University	2	Addendum to the 9th Work Plan. Final Technical Report combined with 9ADR9.
9ADR11	A Manual of Fertilization and Supplemental Feeding Strategies for Small-Scale Nile Tilapia Culture in Ponds	Diana	University of Michigan	1	Work plan in subcontract. The ACRSP publication <i>A Manual of Fertilization and Supplemental Feeding Strategies for Small-Scale Nile Tilapia Culture in Ponds</i> was accepted in lieu of the Final Technical Report.
9ASMR2	Model for Determining Aquaculture Pond Water Quality and Effluent Characteristics	Piedrahita	University of California, Davis	3	Addendum to the 9th Work Plan; the Principal Investigator declined funding during final subcontract negotiations. Cancelled.
9ATR1	On-Farm Trials: Evaluation of Alternative Aquaculture Technologies by Local Farmers in Kenya	Veverica	Auburn University	1	
9ATR2	Linkages of Aquaculture within Watersheds and Concurrent Design of Hillside Ponds	Tollner	University of Georgia	1	Addendum to the 9th Work Plan

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9DM2	PD/ A CRSP Central Database: Development and Management	Bolte	Oregon State University	1	Addendum to the 9th Work Plan. Final Report in 19AAR.
9DSSR2	Decision Support Systems for Fish Population Management and Scheduling in Commercial Pond Aquaculture Operations	Bolte	Oregon State University	1	Addendum to the 9th Work Plan; see CRSP website for Decision Support Systems.
9DSSR3	Enhancing the POND® Decision Support System for Economics, Education, and Extension	Bolte	Oregon State University	2	Addendum to the 9th Work Plan
9ER1	Use of Pond Effluents for Irrigation in an Integrated Crop/ Aquaculture System	Boyd	Auburn University	2	Addendum to the 9th Work Plan
9ER2	Fate of Methyltestosterone in the Pond Environment	Schreck	Oregon State University	1	Split into 3 investigations.
9ER2A	Fate of Methyltestosterone in the Pond Environment: Detection of MT in Soil after Treatment with MT Food	Schreck	Oregon State University	2	Revised title.
9ER2B	Fate of Methyltestosterone in the Pond Environment: Detection of MT in Pond Soil from a CRSP Site	Schreck	Oregon State University	2	Addendum to the 9th Work Plan
9ER2C	Fate of Methyltestosterone in the Pond Environment: Impact of MT-Contaminated Soil on Tilapia Sex Differentiation	Schreck	Oregon State University	2	Revised title.
9ER2D	Fate of Methyltestosterone in the Pond Environment: Use of MT in Earthen Ponds with No Record of Hormone Usage	Schreck	Oregon State University	1	Investigation added by MoU.
9ER3	Integrated Recycle Systems for Catfish and Tilapia Culture	Diana	University of Michigan	2	Addendum to the 9th Work Plan. Original work plan replaced.
9ER4	Effects of Water Recycling on Water Quality and Bottom Soils in Shrimp Ponds	Boyd	Auburn University	1	Addendum to the 9th Work Plan. Replaced 8HCD1B.
9FFR2	Growth Performance and Economic Benefits of <i>Oreochromis niloticus</i> / <i>Clarias gariepinus</i> Polyculture Fed on Three Supplementary Feeds in Fertilized Tropical Ponds	Veverica	Auburn University	2	Addendum to the 9th Work Plan. Final Technical Report for Objective 1 of original 9FFR2 with title revised title.

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9FFR2A	Fish Yields and Economic Benefits of Tilapia / <i>Clarias</i> Polyculture in Fertilized Ponds Receiving Commercial Feeds or Pelleted Agricultural By-Products	Engle	University of Arkansas at Pine Bluff	1	Addendum to the 9th Work Plan. Final Technical Report for Objective 2 of original 9FFR2 with original title.
9FFR3	Reduction of Rations below Satiation Levels	Brown	Florida International University	2	Addendum to the 9th Work Plan
9FFR4	Timing of the Onset of Supplemental Feeding	Brown	Florida International University	2	Addendum to the 9th Work Plan
9FFR5	Educational Development Activities in Support of Tilapia Aquaculture in the Philippines	Brown	Florida International University	1	See 9HCD4.
9FFR6	Development of Training Modules for Aquaculture Extension Workers and University Students in Kenya	Bowman	Oregon State University	1	Work plan in MoU.
9HCD2	Building Research Capacity in CRSP Host Countries	McNamara	Oregon State University	3	Addendum to the 9th Work Plan. The Principal Investigator declined funding. Cancelled.
9HCD3	Institutionalizing EDC Activities in CRSP Countries	McNamara	Oregon State University	3	Addendum to the 9th Work Plan. The Principal Investigator declined funding. Cancelled.
9HCD4	Educational Development Activities in Support of Tilapia Aquaculture in the Philippines	Brown	Florida International University	2	Addendum to the 9th Work Plan as a replacement of 9HCD2. Reassigned to 9FFR5.
9IMNC2	Report: annual Activities of the Information Management and Networking Component	Clair	Oregon State University	1	Work plan in MoU. Reported in 17AAR and 18AAR.
9IMNC3	Report: annual Activities of the Information Management and Networking Component	Clair	Oregon State University	1	Work plan in MoU. Reported in 19AAR.
9MEAR3	Development of Central American Markets for Tilapia Produced in the Region	Engle	University of Arkansas at Pine Bluff	1	



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9MEAR4	Economic and Social Returns to Technology and Investment in Thailand	Engle	University of Arkansas at Pine Bluff	1	
9MEAR5	Rapid Economic Evaluation Tools	Popma	Auburn University	2	Addendum to the 9th Work Plan.
9NS1	Lotus-Fish Culture in Ponds: Recycling of Pond Mud Nutrients	Diana	University of Michigan	2	Addendum to the 9th Work Plan; Work Plan and title replaced.
9NS2	Culture of Mixed-Sex Nile Tilapia with Predatory Snakehead	Diana	University of Michigan	2	Addendum to the 9th Work Plan
9NS3	Development of Sustainable Pond Aquaculture Practices for <i>Colossoma macropomum</i> and <i>Piaractus brachypomus</i> in the Peruvian Amazon	Kohler	Southern Illinois University at Carbondale	2	Addendum to the 9th Work Plan. Final Technical Report combined with 9NS6.
9NS3A	Spawning and Grow-Out of <i>Colossoma macropomum</i> and / or <i>Piaractus brachypomus</i>	Kohler	Southern Illinois University at Carbondale	2	Addendum to the 9th Work Plan; Objective 1 of 9NS3. Reported under title: "Practical Diet Development for Broodstock of <i>Colossoma macropomum</i> and <i>Piaractus brachypomus</i> "
9NS4	Semi-Intensive Culture of Red Tilapia in Brackishwater Ponds	Diana	University of Michigan	1	Addendum to the 9th Work Plan.
9NS5	Supplemental Feeding for Semi-Intensive Culture of Red Tilapia in Brackishwater Ponds	Diana	University of Michigan	1	Work plan in subcontract.
9NS6	Sustainable Aquaculture in the Peruvian Amazon	Kohler	Southern Illinois University at Carbondale	1	Work plan in subcontract. Combined with 9NSR3 for Final Technical Report.
9PDR2	Pond Soil Characteristics and Dynamics of Soil Organic Matter and Nutrients	Boyd	Auburn University	2	Addendum to the 9th Work Plan.
9RA1	Establishment of New Collaboration in Bangladesh	Diana	University of Michigan	1	Work plan in subcontract.

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9RCR5	Masculinization of Tilapia by Immersion in Trenbolone Acetate	Schreck	Oregon State University	1	Split into 3 studies.
9RCR5A	Masculinization of Tilapia by Immersion in Trenbolone Acetate: Effect of treatment timing and dose on masculinization with trenbolone acetate	Schreck	Oregon State University	1	
9RCR5B	Masculinization of Tilapia by Immersion in Trenbolone Acetate : Growth performance of trenbolone acetate-immersed tilapia	Schreck	Oregon State University	2	Addendum to the 9th Work Plan.
9RCR5C	Masculinization of Tilapia by Immersion in Trenbolone Acetate: Detection of trenbolone acetate in water after treatment	Schreck	Oregon State University	2	Addendum to the 9th Work Plan.
9RCR5D	Masculinization of Nile Tilapia Fry by Immersion in Trenbolone Acetate: Reuse of HormoneSolution and Effects of Temperature	Schreck	Oregon State University	1	Investigation added by MoU.
9RCR6	Selection of Individuals for Sex Inheritance Characteristics for Use in Monosex Production	Phelps	Auburn University	2	Addendum to the 9th Work Plan. Two studies, 9RCR6B and 9RCR6C, were cancelled.
9RCR6A	Monosex Tilapia Production through Androgenesis: Selection of Individuals for Sex Inheritance Characteristics for Use in Monosex Production	Phelps	Auburn University	2	Final Report on 9RCR6; revised title.
9RCR6B	Monosex Tilapia Production through Androgenesis: Verification of Androgenically Produced Males, Their Viability, and the Influence of the Female on Progeny Sex Ratios	Phelps	Auburn University	3	Cancelled. See 9RCR6.
9RCR6C	Monosex Tilapia Production through Androgenesis: Growth of Genetically Derived Males in Production Settings	Phelps	Auburn University	3	Cancelled. See 9RCR6.
9RCR7	Monosex Tilapia Production through Androgenesis	Shelton	University of Oklahoma	3	Addendum to the 9th Work Plan; no androgenotes reached maturity thereby preventing verification of sex ratios. Cancelled. Progress Report in 19ATR.

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9RCR8	The Application of Ultrasound to Produce All-Male Tilapia Using Immersion Protocol	Diana	University of Michigan	1	Addendum to the 9th Work Plan.
<b>10<sup>th</sup> Work Plan</b>					
10ADR1	Institutionalizing Techniques for Building Hillside and Levee Ponds for Water Supply and Aquacultural Development in Latin America	Tollner	University of Georgia	1	
10ASMR1	Development of a Trophic Box Model to Assess Potential of Ecologically Sound Management for Cove Aquaculture Systems in Tri An Reservoir, Vietnam	Diana	University of Michigan	1	
10ATR1	Regionalizing Training and Technical Assistance for Nongovernmental Organizations	Tollner	University of Georgia	1	
10ATR2	Institutionalizing Web-based Information System for Tilapia Culture in Latin America	Tollner	University of Georgia	1	
10ATR3	Diversification of Aquacultural Practices by Incorporation of Native Species and Implementation of Alternative Sex Inversion Techniques	Schreck	Oregon State University	1	
10ATR4	On-Station and On-Farm Trials of Different Fertilization Regimes Used in Bangladesh	Diana	University of Michigan	2	Split into 2 investigations. See 10ATR4A and 10ATR4B
10ATR4A	On-Station and On-Farm Trials of Different Fertilization Regimes Used in Bangladesh	Diana	University of Michigan	1	See 10ATR4.
10ATR4B	On-Farm Trials of Different Fertilization Regimes Used in Bangladesh	Diana	University of Michigan	2	Revised title. See 10ATR4.
10ATR5	Use of Clinoptilolite Zeolites for Ammonia-N Transfer and Retention in Integrated Aquaculture Systems and for Improving Pond Water Quality before Discharge	Batterson	Michigan State University	1	
10DSSR1	Aquaculture CRSP Database: Finalization, Management, and Distribution	Diana	University of Michigan	1	Work plan in subcontract.

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10ER1	Reaction of Liming Materials in Pond Bottom Soils	Boyd	Auburn University	1	
10ER2	Elimination of Methyltestosterone (MT) from Intensive Masculinization Systems: Use of Activated Charcoal in Concrete Tanks	Schreck	Oregon State University	1	
10ER3	Environmental Impacts of Cage Culture for Catfish in Chau Doc, Vietnam	Diana	University of Michigan	2	Revised title in Final Technical Report: "Chau Doc" replaced by "Hongngu"
10FFR1	Nutrition of <i>Colossoma macropomum</i> and <i>Piaractus brachypomus</i>	Kohler	Southern Illinois University at Carbondale	1	
10FFR2	Broodstock Diets and Spawning of <i>Colossoma macropomum</i> and/or <i>Piaractus brachypomus</i>	Dabrowski	Ohio State University	1	
10FFR2A	Broodstock Diets and Spawning of <i>Colossoma macropomum</i> and/or <i>Piaractus brachypomus</i>	Dabrowski	Ohio State University	1	
10FFR3	Polyculture of Grass Carp and Nile Tilapia with Napier Grass as the Sole Nutrient Input in the Subtropical Climate of Nepal	Diana	University of Michigan	1	
10FFR4	Development of Economically Feasible Feeds for Semi-Intensive Culture of Tilapia, <i>Oreochromis niloticus</i> , Using Locally Available Agricultural By-Products	Lim & Phelps	Auburn University	2	Investigation split into two studies with revised titles.
10FFR4A	Development and Evaluation of the Nutritive and Economic Potential of Formulated Fish Feeds and Comparison with Locally Available Feeds for Semi-Intensive Production of Nile Tilapia ( <i>Oreochromis niloticus</i> )	Lim & Phelps	Auburn University	1	
10FFR4B	Effect of Feeding Duration of Sodium Chloride Containing Diets on Growth Performance and Some Osmoregulatory Parameters of Nile Tilapia ( <i>Oreochromis niloticus</i> ) After Transfer to Water of Different Salinities	Lim & Phelps	Auburn University	1	

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10FSR1	Income, Food Security, and Poverty Reduction: Case Studies of Functioning Clusters of Successful Small-Scale Aquaculture Producers	Molnar	Auburn University	1	
10GISR1	A Study of Aquaculture Brownfields: Abandoned and Converted Shrimp Ponds in Thailand	Diana	University of Michigan	1	
10GISR2	Assessing Watershed Ponds for Aquaculture Development in Thai Nguyen, Vietnam	Diana	University of Michigan	1	
10MEAR1	Optimal (Profit-Maximizing) Target Markets for Small and Medium-Scale Tilapia Farmers in Honduras and Nicaragua	Engle	University of Arkansas at Pine Bluff	2	Split into 2 studies.
10MEAR1A	A Mixed-Integer Transshipment Model for Tilapia ( <i>Oreochromis</i> sp.) Marketing in Honduras	Engle	University of Arkansas at Pine Bluff	2	Revised title.
10MEAR1B	A Mixed-Integer Transshipment Model for Tilapia ( <i>Oreochromis</i> sp.) Marketing Strategies in Nicaragua	Engle	University of Arkansas at Pine Bluff	2	Revised title.
10MEAR2	Development and Evaluation of a Simple Market Feasibility Assessment Methodology	Engle	University of Arkansas at Pine Bluff	1	
10MEAR3	Regional Enterprise Budget and Business Plan Development	Engle	University of Arkansas at Pine Bluff	2	The ACRSP publication <i>Tilapia Farm Business Management and Economics Manual</i> was accepted in lieu of the Final Technical Report.
10MEAR4	Economic and Risk Analysis of Tilapia Production in Kenya	Engle	University of Arkansas at Pine Bluff	1	
10NSR1	Amazon Aquaculture Outreach	Kohler	Southern Illinois University at Carbondale	1	

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10NSR2	Studies on Reproduction and Larval Rearing of Amazonian Fish	Dabrowski	Ohio State University	2	Combined in 10 <sup>th</sup> Work Plan with 10NSR2A. Final Technical Report in 21ATR merged 10NSR2A into 10NSR2.
10NSR2A	Studies on Reproduction and Larval Rearing of Amazonian Fish	Dabrowski	Ohio State University	2	See 10NSR2.
10NSR3	Survey Study of and Stocking Densities for Tilapia-Shrimp Polycultures	Fitzsimmons	University of Arizona	1	Split into 5 investigations.
10NSR3A	Survey Study of and Stocking Densities for Tilapia-Shrimp Polycultures: Survey of Tilapia-Shrimp Polycultures in Vietnam and Thailand	Fitzsimmons	University of Arizona	1	
10NSR3B	Survey Study of and Stocking Densities for Tilapia-Shrimp Polycultures: Stocking Densities for Tilapia-Shrimp Polyculture in Thailand	Fitzsimmons	University of Arizona	1	
10NSR3C	Survey Study of and Stocking Densities for Tilapia-Shrimp Polycultures: Survey of Tilapia-Shrimp Polycultures in Mexico and Honduras	Fitzsimmons	University of Arizona	1	
10NSR3D	Survey Study of and Stocking Densities for Tilapia-Shrimp Polycultures: Stocking Densities for Tilapia-Shrimp Polyculture in Mexico	Fitzsimmons	University of Arizona	1	
10NSR3E	Survey Study of and Stocking Densities for Tilapia-Shrimp Polycultures: Survey of Tilapia-Shrimp Polycultures in Philippines	Fitzsimmons	University of Arizona	1	
10NSR4	Evaluation of Growth and Reproductive Performance of Three Strains of Nile Tilapia <i>Oreochromis niloticus</i> Found in Kenya for Use in Aquaculture	Phelps	Auburn University	2	Split into 2 investigations.
10NSR4A	Evaluation of Growth and Reproduction Capacity of Three Strains of Nile Tilapia, <i>Oreochromis niloticus</i> , Found Locally in Kenya for Use in Aquaculture	Phelps	Auburn University	2	Revised title.

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10NSR4B	Evaluation of Growth and Reproduction Capacity of Three Strains of Nile Tilapia, <i>Oreochromis niloticus</i> , Found Locally in Kenya for Use in Aquaculture	Phelps	Auburn University	2	Revised title.
10PDR1	Effects of Pond Age on Bottom Soil Quality	Boyd	Auburn University	1	
10PDR2	Workshops on Using Principles of Pond Dynamics to Optimize Fertilization Efficiency	Batterson	Michigan State University	1	
10PDR3	Aquaculture Training for Kenyan Fisheries officers and University Students	Langdon	Oregon State University	1	
10PDVR1	Characteristics of Fish Buyers Likely to Purchase Farm-Raised Tilapia in Honduras and Nicaragua	Engle	University of Arkansas at Pine Bluff	1	
10PDVR2	Cost Containment Options for Tilapia Production in Central Luzon, Republic of the Philippines	Brown	Florida International University	1	
10PDVR3	Transfer of Production Technology to Nepal for Nile Tilapia, <i>Oreochromis niloticus</i>	Diana	University of Michigan	1	
10RCR1	Studies on Fate of Methyltestosterone and Its Metabolites in Tilapia and on the Use of Phytochemicals as an Alternative Method to Produce a Monosex Population of Tilapia	Dabrowski	Ohio State University	1	
10RCR2	Selection of a New Nile Tilapia Genetic Line to Provide Broodstock for Southeastern Mexico	Schreck	Oregon State University	1	
10RCR3	IGF as a Growth Rate Indicator in <i>Oreochromis niloticus</i>	Brown	Florida International University	1	

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<b>11<sup>th</sup> Work Plan</b>					
11AHHR1	Cross-Sectoral and International Extension Exchange and Learning	Haws	University of Hawaii at Hilo	1	Addendum to 11th Work Plan.
11AHHR2	Connectivity of Water Resource Status, Environmental Quality, Aquaculture, and Human Health	Haws	University of Hawaii at Hilo	1	Addendum to 11th Work Plan.
11AHHR3	Analysis of Critical Points in Aquaculture Production Affecting Participation and Level of Benefits to Women, Youth, and Disadvantaged Stakeholders	Haws	University of Hawaii at Hilo	1	Addendum to 11th Work Plan.
11ATER1	Training Local Farmers on Safe Handling of Steroids and Masculinization Techniques in Central America	Schreck	Oregon State University	1	
11ATER2	Aquaculture CRSP Sponsorship of the Sixth International Symposium on Tilapia in Aquaculture	Fitzsimmons	University of Arizona	1	
11ATER3	Aquaculture CRSP—Global Contributions to Sustainable Aquaculture: A Special Session at the 2004 World Aquaculture Conference	Fitzsimmons	University of Arizona	1	
11ATER4	Aquaculture Training for Kenyan Fisheries Assistants	Langdon	Oregon State University	1	
11ATER5	Evaluation of Aquaculture Training Provided to Fisheries Officers and Fisheries	Langdon	Oregon State University	1	Work plan in MoU.
11ATER6	Development of An Aquaculture Handbook For Extension Workers and Trainers of Extension Workers and Sub-Saharan Africa	Langdon	Oregon State University	1	Work plan in MoU. Associated with 12ATE11; Final Technical Report repeated in 25ATR.
11DPPR1	Food Safety and Handling: Increasing Local Consumption of Aquaculture Products and Improving Quality	Haws	University of Hawaii at Hilo	1	Addendum to 11th Work Plan.
11EIAR1	Co-Culture of Lotus and Hybrid Catfish to Recycle Wastes from Intensive Feeding Environmental	Diana	University of Michigan	1	
11EIAR2	Further Studies on Soil Quality in Aquaculture Ponds in Thailand	Boyd	Auburn University	1	



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11ERAR1	Preliminary Work on Site Description, Evaluation and Development Planning: Tanzania, Ghana, and Kenya	Quagraine	University of Arkansas at Pine Bluff	1	
11ERA2	Cost Evaluation and Benefit Assessment of Fish Farming in Selected African Nations	Quagraine	Purdue University	1	Addendum to 11 <sup>th</sup> Work Plan.
11ERA3	An Economic Assessment of Aquaculture in Rural Africa: The Case of Tanzania, Kenya and Ghana	Quagraine	Purdue University	1	Addendum to 11th Work Plan.
11ERA4	A Cross-National Analysis of the Potential Economic Impact of Aquaculture in Africa	Quagraine	Purdue University	1	Addendum to 11th Work Plan.
11FNFR1	Nutrition and Nutrient Utilization in Native Peruvian Fishes	Kohler	Southern Illinois University	1	
11FNFR2	Evaluation of Tilapia Aquaculture Best Practices in Central Luzon, the Philippines	Brown	Florida International University	1	
11FNFR3	Use of Phytochemicals as an Environmentally-Friendly Method to Sex-Reverse Nile Tilapia	Dabrowski	Ohio State University	1	
11FNFR4	Insulin-like Growth Factor-I as a Growth Indicator in Tilapia	Brown	Florida International University	1	
11ISDR1	Broodstock Development and Larval Feeding of Amazonian Fishes	Kohler	Southern Illinois University	2	Split into 2 investigations.
11ISDR1A	Broodstock Development and Larval Feeding of Amazonian Fishes	Kohler	Southern Illinois University	1	Objective 1 of 11ISDR1.
11ISDR1B	Broodstock Development and Larval Feeding of Amazonian Fishes	Kohler	Southern Illinois University	1	
11ISDR2	Controlled Reproduction of an Important Indigenous Species, <i>Spinibarbus denticulatus</i> , in Southeast Asia	Diana	University of Michigan	1	

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11ISDR3	Development of Aquaculture Techniques for the Indigenous Species of Southern Mexico, <i>Centropomus undecimalis</i> : Sex Determination and Differentiation and Effects of Temperature	Patiño	Texas Tech University	1	Reprinted in Addendum to 11 <sup>th</sup> Work Plan due to a printing error omission in the 11 <sup>th</sup> Work Plan. Incorrectly coded as 11.5ISD3 in the Addendum Table of Contents.
11PSDR1	Diversification Into Sustainable Tilapia-Shrimp Polyculture and Small-Scale Tilapia Cage Culture in Mexico	Fitzsimmons	University of Arizona	2	
11PSDR2	New Paradigm in Farming of Freshwater Prawn ( <i>Macrobrachium rosenbergii</i> ) With Closed and Recycle Systems	Diana	University of Michigan	1	
11PSDR3	Integrated Cage-Cum-Pond Culture Systems with High-Valued Fish Species in Cages and Low-Valued Species in Open Ponds	Diana	University of Michigan	2	Split into 3 investigations.
11PSDR3A	Integrated Cage-Cum-Pond Culture Systems With High-Valued Stinging Catfish ( <i>Heteropneustes fossilis</i> ) in Cages and Low-Valued Carps in Open Ponds	Diana	University of Michigan	2	Revised title.
11PSDR3B	Integrated Cage-Cum-Pond Culture Systems With High-Valued Sahar ( <i>Tor putitora</i> ) in Cages Suspended in Carp Polyculture Ponds	Diana	University of Michigan	2	Revised title.
11PSDR3C	Integrated Cage-Cum-Pond Culture Systems With High-Valued Climbing Perch ( <i>Anabas testudineus</i> ) in Cages Suspended in Nile Tilapia ( <i>Oreochromis niloticus</i> ) Ponds	Diana	University of Michigan	2	Revised title.
11PSDR4	Mitigating Environmental Impact of Cage Culture through Integrated Cage-Cum-Cove Culture System in Tri An Reservoir of Vietnam	Diana	University of Michigan	1	
11PSDR5	Optimization of Nitrogen Fertilization Regime in Fertilized Nile Tilapia Ponds With Supplemental Feed	Diana	University of Michigan	1	
11PSDR6	Workshop on Fertilization Strategies for Pond Culture in Bangladesh	Diana	University of Michigan	1	

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11SDFR1	Amazon Aquaculture Outreach	Kohler	Southern Illinois University	1	
11SDFR2	Tilapia ( <i>Oreochromis niloticus</i> ) Production Constraints in Bangladesh	Diana	University of Michigan	2	Split into 3 investigations by objectives.
11SDFR2A	Tilapia ( <i>Oreochromis niloticus</i> ) Production Constraints in Bangladesh: A) Socio-Economic Perspective	Diana	University of Michigan	2	Objective 1 of 11SDFR2. Revised title.
11SDFR2B	Tilapia ( <i>Oreochromis niloticus</i> ) Production Constraints in Bangladesh: B) Technological Constraints	Diana	University of Michigan	2	Objective 2 of 11SDFR2. Revised title.
11SDFR2C	Tilapia ( <i>Oreochromis niloticus</i> ) Production Constraints in Bangladesh: C) Workshop and Expert Panel Meeting on Tilapia Culture in Bangladesh	Diana	University of Michigan	2	Objective 3 of 11SDFR2. Revised title.
11SDFR3	Reproductive Performance and Growth of Improved Tilapia, <i>Oreochromis niloticus</i>	Diana	University of Michigan	1	
11SSDR1	Mitigating the Effects of High Temperature and Turbidity on Seed Production of Nile Tilapia from Hapa-in-Pond Systems	Diana	University of Michigan	2	Reported as 11SDAR1 in 22ATR.
11SSDR2	Evaluation and Improvement of Tilapia Fingerling Production and Availability in Honduras	Molnar	Auburn University	2	Reported as 11SDAR2 in 22ATR.
11SSDR3	Continuation of a Selective Breeding Program for Nile Tilapia to Provide Quality Broodstock for Central America	Schreck	Oregon State University	2	Reported as 11SDAR3 in 22ATR.
11WQAR1	Elimination of Methyltestosterone from Intensive Masculinization Systems: Use of Ultraviolet Irradiation of Water	Schreck	Oregon State University	1	
11WQAR2	Use of a Wetland to Treat Effluent from a Flow-Through Aquaculture System	Boyd	Auburn University	2	Final Technical Report title: "Macrophyte Biofilter For Treating Effluent From Aquaculture"
11WQAR3	Pond Design and Watershed Analyses Training	Tollner	University of Georgia	1	

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11WQAR4	Influence of Daily Feed Allowance on Pond Water and Effluent Quality	Boyd	Auburn University	1	
<b>12<sup>th</sup> Work Plan</b>					
12AHH1	Water Quality Monitoring and Identification of Pollution Sources Leading Towards Classification of Bivalve Growing Waters	Haws	University of Hawaii at Hilo	1	
12AHH2	Outreach and Planning for Implementation of Bivalve Growing Areas Classification and Related Sanitation Action Items	Haws	University of Hawaii at Hilo	1	
12ATE1	Integrated Cage-Cum-Pond Culture Systems with High-Valued Fish Species in Cages and Low-Valued Species in Open Ponds	Diana	University of Michigan	2	Split into 3 investigations by country.
12ATE1A	Integrated Cage-Cum-Pond Culture Systems with High-Valued Fish Species in Cages and Low-Valued Species in Open Ponds: Climbing Perch ( <i>Anabas testudineus</i> ) and Carps in Bangladesh	Diana	University of Michigan	2	See 12ATE1. Revised title.
12ATE1B	Integrated Cage-Cum-Pond Culture Systems with High-Valued Fish Species in Cages and Low-Valued Species in Open Ponds: African Catfish ( <i>Clarias gariepinus</i> ) and Carps in Nepal	Diana	University of Michigan	2	See 12ATE1. Revised title.
12ATE1C	Integrated Cage-Cum-Pond Culture Systems with High-Valued Fish Species in Cages and Low-Valued Species in Open Ponds: African Catfish ( <i>Clarias gariepinus</i> ) and Tilapia ( <i>Oreochromis niloticus</i> ) in Vietnam	Diana	University of Michigan	2	See 12ATE1. Revised title.
12ATE2	Reproductive Performance and Growth of Improved Tilapia, <i>Oreochromis niloticus</i>	Diana	University of Michigan	1	
12ATE3	Aquaculture Training for Kenyan Extension Workers, Fish Farmers, and University Students	Langdon	Oregon State University	1	
12ATE4	Training Local Farmers on Safe Handling of Steroids and Masculinization Techniques in Central America	Schreck	Oregon State University	1	

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12ATE5	Establishment of the Center for Aquaculture Technology Transfer	Baker	Cornell University	1	
12ATE6	Diversifying and Strengthening Aquaculture Extension Capacity to Develop a Regional Extension Service Model	Haws	University of Hawaii at Hilo	1	
12ATE7	Site Visits and Information Exchange on Cichlid Culture and the Adoption of Aquaculture CRSP Technologies in ACRSP Host Countries	Bowman	Oregon State University	2	Final Report in 24AAR; combined with 12ATE8.
12ATE8	Comparison of the Implementation of CRSP Technologies in Five Aquaculture CRSP Host Countries	Bowman	Oregon State University	2	See 12ATE7.
12ATE9	Special Sessions, Travel, and Poster Awards at 2005 and 2006 World Aquaculture Conferences and Aquaculture America-2006	Fitzsimmons	University of Arizona	2	1st Addendum to 12th Work Plan; supplemental funding expanded the scope of travel and awards.
12ATE10	Aquaculture CRSP Sponsorship of the Seventh International Symposium on Tilapia in Aquaculture	Fitzsimmons	University of Arizona	1	
12ATE11	Kenya Training of Trainers and Regionalization of Aquaculture Training Activities	Langdon	Oregon State University	1	1st Addendum to 12th Work Plan. See 11ATER6.
12ATE12	Aquaculture CRSP Sponsorship of the Second International Symposium On Cage Aquaculture in Asia	Diana	University of Michigan	1	1st Addendum to 12th Work Plan.
12ATE13	Promoting Environmentally-Friendly Integrated Cage-Cum-Pond Culture Systems	Diana	University of Michigan	1	1st Addendum to 12th Work Plan.
12ATE14	Post-Tsunami Training in New Aquaculture Technologies in Thailand and Indonesia	Fitzsimmons	University of Arizona	1	1st Addendum to 12th Work Plan.
12ATE15	Aquaculture CRSP Support for IIFET 2006 Portsmouth	Johnston	Oregon State University	1	2nd Addendum to 12th Work Plan.
12ATE16	Workshops for the Cultivation of New Species in Brazil and Peru	Dabrowski	Ohio State University	1	2nd Addendum to 12th Work Plan.

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12ATE17	ACRSP Support for Development of Aquaculture Economics	Johnston	Oregon State University	1	2nd Addendum to 12th Work Plan.
12ATE18	Special Sessions, Travel and Poster Awards at 2007 World Aquaculture Conference, Site Descriptions Update	Fitzsimmons	University of Arizona	1	2nd Addendum to 12th Work Plan.
12EIA1	Best Practices for Management of Aquaculture Pond Soils in Thailand	Boyd	Auburn University	1	
12EIA2	Establishment of Links with Chinese Institutions in Collaboration on Aquaculture and Environmental Impacts	Diana	University of Michigan	1	
12EIA3	Impact of Tilapia, <i>Oreochromis niloticus</i> Introduction on the Indigenous Species of Bangladesh, Nepal, Thailand and Cambodia	Diana	University of Michigan	2	Final Technical Report for Bangladesh and Nepal only.
12EIA4	Building the Capacity of Moi University to Conduct Watershed Assessment	Tollner	University of Georgia	1	
12EIA5	Land-use Practices, Policy and Tenure Regimes in the Nzoia River Basin	Tollner	University of Georgia	1	
12EIA6	Workshops on Guidelines for Developing Aquaculture Best Management Practices	Boyd	Auburn University	1	
12EIA7	Workshops on Better Practices for Sustainable Aquaculture	Boyd	Auburn University	1	2nd Addendum to 12th Work Plan.
12EIA8	Building the Capacity of Moi University to Have a Working GIS Lab and First Generation GIS Model of the Nzoia River Basin	Tollner	University of Georgia	1	2nd Addendum to 12th Work Plan.
12ERA1	Assessment of Coastal and Marine Aquaculture Development for Low Trophic Level Species	Diana	University of Michigan	1	
12ERA2	Hydraulic, Water Quality and Social Assessment of the Nzoia Basin, Kenya	Tollner	University of Georgia	1	
12ERA3	Farmers Training in Tanzania	Quagraine	Purdue University	1	

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12ERA5	Ex Ante Assessment of Coastal and Marine Aquaculture Development: Charting Comparative Strengths and Weaknesses of Low Trophic Species for offshore Aquaculture in Developed and Developing Countries	Skladany	Institute for Agriculture & Trade Policy	1	
12ERA6	Bivalve Market Study in Pacific Mexico	Haws	University of Hawaii at Hilo	1	1st Addendum to 12th Work Plan.
12FNF1	Effects of Native Peruvian Feedstuffs on Growth and Health of <i>Colossoma</i> and <i>Piaractus</i>	Kohler	Southern Illinois University	1	
12FNF2	Nutrition and Nutrient Utilization in Native Peruvian Fishes	Kohler	Southern Illinois University	1	
12FNF3	Use of Phytochemicals as a New Method to Sex-Reverse Nile Tilapia and Tropical Gar Fish	Dabrowski	Ohio State University	2	Split into 2 investigations by experimental objective.
12FNF3A	Use of Phytochemicals as a New Method to Sex-Reverse Nile Tilapia and Tropical Garfish. Part I: Use of Aqueous Plant Extracts in Tilapia	Dabrowski	Ohio State University	2	See 12FNF3. Revised title.
12FNF3B	Use of Phytochemicals as a New Method to Sex-Reverse Nile Tilapia and Tropical Garfish. Part II: Initiation of Feeding and Gonad Differentiation in Longnose Garfish	Dabrowski	Ohio State University	2	See 12FNF3. Revised title.
12FNF4	Reproduction of Pacu ( <i>Piaractus mesopotamicus</i> ) and Surubim ( <i>Pseudoplatystoma tigrinum</i> ) and a New Paradigm in Nutrition of Tropical Fishes	Dabrowski	Ohio State University	1	2nd Addendum to 12th Work Plan.
12ISD1	Controlled Reproduction of an Important Indigenous Species, <i>Spinibarbus denticulatus</i> , in Southeast Asia	Diana	University of Michigan	1	
12ISD2	Broodstock Development of Amazonian Fishes	Kohler	Southern Illinois University	1	

Code <sup>1</sup>	Study Title	Lead US PI <sup>2</sup>	US Institution	Final Status <sup>3</sup>	Comment or Modification Reference <sup>4</sup>
12ISD3	Incorporation of the Native Cichlid <i>Petenia splendida</i> into Sustainable Aquaculture: Reproduction Systems, Nutrient Requirements and Feeding Strategies	Schreck	Oregon State University	1	
12ISD4	Broodstock Development and Larval Feeding of Amazonian Fishes	Dabrowski	Ohio State University	1	
12ISD5	Egg Hatching Quality Of Amazonian Fishes	Kohler	Southern Illinois University	1	2nd Addendum to 12th Work Plan.
12ISD6	Influence Of Dietary Fatty Acid Composition On Reproductive Performance Of <i>Colossoma macropomum</i>	Kohler	Southern Illinois University	1	2nd Addendum to 12th Work Plan.
12PSD1	New Paradigm in Farming of Freshwater Prawn ( <i>Macrobrachium rosenbergii</i> ) With Closed And Recycle Systems	Diana	University of Michigan	2	Split into 3 investigations by country and reported separately as 12PSD1A, 12PSD1B, and 12PSD1C.
12PSD1A	New Paradigm in Farming of Freshwater Prawn ( <i>Macrobrachium rosenbergii</i> ) With Closed And Recycle Systems in Thailand	Diana	University of Michigan	1	
12PSD1B	New Paradigm in Farming of Freshwater Prawn ( <i>Macrobrachium rosenbergii</i> ) With Closed And Recycle Systems in Bangladesh	Diana	University of Michigan	1	
12PSD1C	New Paradigm in Farming of Freshwater Prawn ( <i>Macrobrachium rosenbergii</i> ) With Closed And Recycle Systems in Vietnam	Diana	University of Michigan	1	
12PSD2	Optimization of Fertilization Regimes in Fertilized Nile Tilapia Ponds with Supplemental Feed	Diana	University of Michigan	1	
12PSD3	Use of Rice Straw as a Resource for Freshwater Pond Culture	Diana	University of Michigan	2	Split into 2 investigations by experimental objectives.
12PSD3A	Use of Rice Straw as a Resource for Freshwater Pond Culture: Periphyton Substrate	Diana	University of Michigan	2	See 12PSD3. Revised title.



Code <sup>1</sup>	Study Title	Lead US PI <sup>2</sup>	US Institution	Final Status <sup>3</sup>	Comment or Modification Reference <sup>4</sup>
12PSD3B	Use of Rice Straw as a Resource for Freshwater Pond Culture: Growth Performance	Diana	University of Michigan	2	See 12PSD3. Revised title.
12PSD4	Development of a Recirculating Aquaculture System Module for Family /Multi-Family Use	Baker	Cornell University	1	
12PSD5	Insulin-Like Growth Factor-1 Gene Expression as a Growth Indicator in Nile Tilapia	Brown	Florida International University	1	
12PSD6	Development of Nile Tilapia Fillets as an Export Product for the Philippines	Brown	Florida International University	1	
12PSD7	Tilapia–Shrimp Polyculture in Negros Occidental, Philippines	Fitzsimmons	University of Arizona	1	
12PSD8	Testing Three Styles of Tilapia–Shrimp Polyculture in Tabasco, Mexico	Fitzsimmons	University of Arizona	1	
12PSD9	Student Exchange Program to Strengthen Capacity in Chinese Environmental Studies of Aquaculture	Diana	University of Michigan	2	1st Addendum to 12th Work Plan; split into 2 investigations by experimental objectives.
12PSD9A	Student Exchange Program to Strengthen Capacity in Chinese Environmental Studies of Aquaculture: Preliminary Assessment of Integrated Shrimp/Seaweed Shrimp/ Abalone, and Shrimp/Seaweed/Duck Farming Practices in Yinbin Bay, Hainan Province, China	Diana	University of Michigan	2	See 12PSD9. Revised title.
12PSD9B	Student Exchange Program to Strengthen Capacity in Chinese Environmental Studies of Aquaculture: Application of Phytase in Nile Tilapia Feed	Diana	University of Michigan	2	See 12PSD9. Revised title.
12SDA1	Evaluation and Improvement of Tilapia Fingerling Production and Availability in Honduras	Molnar	Auburn University	1	
12SDA2	Studies on Strategies for Increasing the Growth and Survival of African Catfish ( <i>Clarias gariepinus</i> ) Juveniles Reared for Stocking or for Use as Bait	Langdon	Oregon State University	1	

Code <sup>1</sup>	Study Title	Lead US PI <sup>2</sup>	US Institution	Final Status <sup>3</sup>	Comment or Modification Reference <sup>4</sup>
12SDA3	Continuation of a Selective Breeding Program for Nile Tilapia to Provide Quality Broodstock for Central America	Schreck	Oregon State University	1	
12SDA4	Development of Aquaculture Techniques for the Indigenous Species of Southern Mexico, <i>Centropomus undecimalis</i> : Sex Determination and Differentiation and Effects of Temperature	Patiño	Texas Tech University	1	
12SDA5	Kenya Capacity Building: Student Research and Thesis Support	Langdon	Oregon State University	1	1st Addendum to 12th Work Plan.
12SDA6	Improvement of Tilapia Fingerling Production and Availability in Central America	Molnar	Auburn University	1	1st Addendum to 12th Work Plan.
12SDF1	Amazon Aquaculture Outreach	Kohler	Southern Illinois University	1	
12SDF2	Understanding the Aquacultural Knowledge and Information System for Commercial Tilapia Production in Nicaragua: Economics, Institutions, and Markets	Molnar	Auburn University	2	1st Addendum to 12th Work Plan. Two Final Technical Reports in 24ATR (Objectives 1–3) and 25ATR (Objective 1).
12SDF3	Assessing the Potential for Aquacultural Development to Promote Food Security Among Indigenous People in Guatemala	Molnar	Auburn University	1	
12SDF4	First Annual Sustainable Aquaculture Technology Transfer Workshop	Baker	Cornell University	1	
12SDF5	Amazon Aquaculture Outreach: 5th International Aquaculture Extension Course in the Amazon Region and 1st Meeting For the Amazon Region Aquaculturists	Kohler	Southern Illinois University at Carbondale	1	1st Addendum to 12th Work Plan.
12SDF6	The Eagle of the North and the Condor of the South Aquaculture Exchange Project – Peru	Kohler	Southern Illinois University at Carbondale	2	1st Addendum to 12th Work Plan. Combined with 12FSD8 for the Final Technical Report.

Code <sup>1</sup>	Study Title	Lead US PI <sup>2</sup>	US Institution	Final Status <sup>3</sup>	Comment or Modification Reference <sup>4</sup>
12SDF7	Aquaculture Outreach in the Amazon Basin	Kohler	Southern Illinois University	1	2nd Addendum to 12th Work Plan.
12SDF8	The Eagle of the North and the Condor of the South Aquaculture Exchange Project – Mexico	Fitzsimmons	University of Arizona	2	2nd Addendum to 12th Work Plan. Combined with 12FSD6 for the Final Technical Report.
12SDF9	Sixth International Aquaculture Training Course in the Amazon Region	Kohler	Southern Illinois University	1	2nd Addendum to 12th Work Plan.
12WQA1	Pond Design and Watershed Analyses Training	Tollner	University of Georgia	1	
12WQA2	Elimination of Methyltestosterone from Intensive Masculinization Systems: Use of Ultraviolet Irradiation of Water	Schreck	Oregon State University	1	
12WQA3	Elimination of Methyltestosterone from Intensive Masculinization systems: Use of Solar Irradiation and Bacterial Degradation	Schreck	Oregon State University	1	
12WQA4	Ecological Assessment of Selected Sub-Watersheds of the Nzoia River Basin	Tollner	University of Georgia	1	
12WQA5	Determination of Hydrologic Baselines for the Nzoia Basin	Tollner	University of Georgia	1	
12WQA6	Student Research to Assess Environmental Impacts of Cage Aquaculture in Tong An Bay in Fujian Province of China	Diana	University of Michigan	2	1st Addendum to 12th Work Plan. Revised title, deleting "the Tong An Bay".
12WQA7	Pelagic (Fish) and Benthic Ecology of Selected Sub-Watersheds of the Nzoia River Basin	Tollner	University of Georgia	1	2nd Addendum to 12th Work Plan.
12WQA8	Hydrologic Modeling in the Nzoia River Basin	Tollner	University of Georgia	1	2nd Addendum to 12th Work Plan.



## APPENDIX 2. WORK PLANS & ANNUAL ADMINISTRATIVE REPORTS: 1979 TO 2008

Grant Years	Grant No.	Annual Administrative Reports <sup>5</sup>	Work Plan		
			Title	Publication Date	Duration
1979-1982	AID/DSAN-G-0264	NA	NA	NA	NA
1982-1987	DAN-4023-G-SS-2074-00	First			
		Second	1 <sup>st</sup> Work Plan	July 1983	1983 to 1984 (likely 9/1 to 8/31)
		Third	2 <sup>nd</sup> Work Plan	July 1984	1984 to 1985 (likely 9/1 to 8/31)
		Fourth	3 <sup>rd</sup> Work Plan	July 1985	1985 to 1986 (likely 9/1 to 8/31)
		Fifth			
1987-1990	DAN-4023-G-SS-7066-00	Sixth	4 <sup>th</sup> Work Plan	Revised January 1989	9/1/87 to 8/31/89
		Seventh			
		Eighth	5 <sup>th</sup> Work Plan	Developed May 1989, no printing date	9/1/89 to 8/31/91
1990-1996	DAN-4023-G-00-0031-00	Ninth			
		Tenth	6 <sup>th</sup> Work Plan	Developed March 1991, no printing date	9/1/91 to 8/31/93
		Eleventh <sup>6</sup>			
		Twelfth <sup>2</sup>	7 <sup>th</sup> Work Plan	September 1993	9/1/93 to 8/31/95
		Thirteenth			

<sup>5</sup> All Annual Reports cover the reporting period 1 September through 31 August of the following year. Beginning with the Eleventh Annual Administrative Report, a companion Annual Technical Report was also published. For the Twentieth, only an Annual Administrative Report was published.

<sup>6</sup> The Aquaculture CRSP Egypt project (USAID Grant No. 263-0152-G-00-2231-00) was also reported during the period covered by the Eleventh and Twelfth Annual Reports.

## APPENDIX 2. WORK PLANS & ANNUAL ADMINISTRATIVE REPORTS

Grant Years	Grant No.	Annual Administrative Reports <sup>5</sup>	Work Plan		
			Title	Publication Date	Duration
1996-2006	LAG-G-00-96-90015-00	Fourteenth	Interim Work Plan	May 1996	9/1/95 to 7/31/96
		Fifteenth	8 <sup>th</sup> Work Plan	Summer 1997	8/1/96 to 7/31/98
			1 <sup>st</sup> Addendum	Spring 1998	
			2 <sup>nd</sup> Add.	Spring 1999	
1996-2006	LAG-G-00-96-90015-00		3 <sup>rd</sup> Add.	Fall 2000	
		Sixteenth			
		Seventeenth	9 <sup>th</sup> Work Plan	April 1999	8/1/98 to 4/30/01
			Addendum	Fall 2000	
		Eighteenth			
		Nineteenth			
		Twentieth	10 <sup>th</sup> Work Plan	December 2001	8/1/01 to 4/30/03
		Twenty-first			
		Twenty-second	11 <sup>th</sup> Work Plan	September 2003	8/1/03 to 7/31/04
		Twenty-third	11 <sup>th</sup> Work Plan		8/1/04 to 7/31/05
2006-2008	LAG-G-00-96-90015-00		Addendum	August 2005	
			Part II <sup>7</sup>	August 2005	
			12 <sup>th</sup> Work Plan	October 2005	
		Twenty-fourth	12 <sup>th</sup> Work Plan		8/1/05 to 1/31/08
			Addendum I	August 2006	
			Addendum II	June 2007	
		Twenty-fifth			

<sup>7</sup> Investigations in the 11<sup>th</sup> Work Plan, Part II were transferred to the 12<sup>th</sup> Work Plan with no change to the scientific theme or investigation codes.



### APPENDIX 3. RESEARCH & OUTREACH THEMES: 8<sup>TH</sup> to 12<sup>TH</sup> WORK PLANS

Acronym	Scientific Themes	Work Plan
ADR	Adoption/Diffusion Research or Adoption & Diffusion Research	8th, 9th, 10th
AHH	Aquaculture & Human Health Impacts	12th
AHHR	Aquaculture & Human Health Impacts Research	11th
ASMR	Aquaculture Systems Modeling Research	8th, 9th, 10th
ATE	Applied Technology & Extension Methodologies	12th
ATER	Applied Technology & Extension Methodologies Research	11th
ATR	Appropriate Technology Research	9th, 10th
DM	Database Management	8th, 9th
DPPR	Disease Predation, Prevention, and Food Safety	11th
DSSR	Decision Support Systems Research	8th, 9th, 10th
EIA	Environmental Impacts Analysis	12th
EIAR	Environmental Impacts Analysis Research	11th
ER	Effluents & Pollution Research	9th, 10th
ERA	Economic/Risk Assessment & Social Analysis	12th
ERAR	Economic/Risk Assessment & Social Analysis	11th
FFR	Feeds & Fertilizers Research	8th, 9th, 10th
FNF	Fish Nutrition & Feed Technology	12th
FNFR	Fish Nutrition & Feed Technology Research	11th
FSR	Food Security Research	10th
GISR	GIS: Planning, Policy, & Global Data Analysis Research	10th
HCD	Human Capacity Development	8th, 9th
HR	Honduras Research	8th
IMNC	Information Management & Networking Component	8th, 9th
ISD	Indigenous Species Development	12th
ISDR*	Indigenous Species Development Research	11th
KR	Kenya Research	8th
MEAR	Marketing & Economic Analysis Research	8th, 9th, 10th
NS	New Aquaculture Systems/New Species	9th

Acronym	Scientific Themes	Work Plan
NSR*	New Aquaculture Systems/New Species Research	10th
PDR	Pond Dynamics Research	8th, 9th, 10th
PDVR	Product Diversification Research	10th
PHR	Philippines Research	8th
PR	Peru Research	8th
PSD	Production System Design & Integration	12th
PSDR	Production System Design & Integration Research	11th
RA	Regional Analysis: Human-Environment Interactions	9th
RCR	Reproduction Control Research	8th, 9th, 10th
SDA	Seedstock Development & Availability	12th
SDF	Sustainable Development & Food Security	12th
SDFR*	Sustainable Development & Food Security Research	11th
SSDR	Seedstock Development & Availability Research	11th
TR	Thailand Research	8th
WQA	Water Quality & Availability	12th
WQAR*	Water Quality & Availability Research	11th

\* Scientific theme codes introduced in the 11<sup>th</sup> Work Plan and transferred to the 12<sup>th</sup> Work Plan without the terminal "R" (Research) in the acronym.



## APPENDIX 4. COMPENDIUM OF PUBLICATIONS: 1982 through 2008

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### *I. REGIONAL RESEARCH: CENTRAL AMERICA AND THE AMAZON BASIN*

#### *A. HONDURAS PROJECTS*

##### **1. ASIAN INSTITUTE OF TECHNOLOGY**

###### **Publications**

Munsiri, P. and B.F. Hajek, 1996. Texture and chemical composition of soils from shrimp ponds near Choluteca, Honduras. *Aquaculture International*, 4:154–168.

##### **2. AUBURN UNIVERSITY**

###### **Theses**

Green, B.W., 1992. Water and chemistry budgets for organically fertilized fish ponds in the dry tropics. Ph.D. dissertation, Auburn University, Auburn, Alabama.

Martinez-Mejia, P., 2004. Case study of commercial tilapia production in Olancho, Honduras. M.S. thesis, Auburn University, Auburn, Alabama.

Meyer, Suyapa Triminio, 2005. Tilapia fingerlings production in Honduras. Auburn University. M.Sc. Thesis. 8 August 2005.

Trejos-Castillo, E., 2003. Income, food security, and poverty reduction: Case studies of small-scale aquaculture producers in Santa Barbara, Honduras. M.Sc. thesis, Auburn University, Auburn, Alabama.

###### **Publications**

Alvarenga, H.R. and B.W. Green, 1985. Production of hybrid tilapia (*Tilapia nilotica* x *Tilapia honorum*) fingerlings. CRSP Technical Report (unpubl.), 12 pp. (in Spanish)

Alvarenga, H.R. and B.W. Green, 1986. Growth and production of all male *Tilapia nilotica* and all male hybrid tilapia (*Tilapia nilotica* x *Tilapia honorum*) in ponds. *Rev. Latinoamericana de Acuicultura*, 29:6–10. (in Spanish)

Alvarenga, H.R. and B.W. Green, 1989. Production and economic aspects of tilapia culture in ponds fertilized with chicken litter. *Rev. Latinoamericana de Acuicultura*, 40:35–39. (in Spanish)

Alvarenga, H.R., B.W. Green, and M.I. Rodriguez, 1984. A system for producing hybrid tilapia (*Tilapia nilotica* x *Tilapia honorum*) fingerlings at the El Carao Aquaculture Experiment Station, Comayagua, Honduras. CRSP Technical Report (unpubl.), 9 pp. (in Spanish)

Alvarenga, H.R., B.W. Green, and M.I. Rodriguez, 1985. Pelleted fish feed vs. corn gluten as feed for tilapia and Chinese carp polyculture in ponds. CRSP Technical Report (unpubl.), 2 pp. (in Spanish)

Alvarenga, H.R., B.W. Green, and M.I. Rodriguez, 1987. Production of hybrid tilapia (*Tilapia nilotica* x *Tilapia honorum*) in ponds using corn gluten as a supplemental feed. CRSP Technical Report (unpubl.), 13 pp. (in Spanish)

Ayub, M., C.E. Boyd, and D.R. Teichert-Coddington, 1993. Effects of urea application, aeration, and drying on total carbon concentrations in pond bottom soils. *The Progressive Fish-Culturist*, 55:210–213.



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- Boyd, C.E. and D.R. Teichert-Coddington, 1992. Relationship between wind speed and reaeration in small aquaculture ponds. *Aquacultural Engineering*, 11:121–131.
- Boyd, C.E. and D.R. Teichert-Coddington, 1994. Pond bottom soil respiration during fallow and culture periods in heavily-fertilized tropical fish ponds. *Journal of the World Aquaculture Society*, 25(3):210–213.
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### **Presentations**

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- Bart, Amrit, 2005. Comparison of Reproductive Parameters among improved strains of Nile Tilapia *Oreochromis niloticus* L. Mexico (HCPI), October 2005.
- Bart, Amrit, 2005. Study of an indigenous, herbivorous species, *Spinibarbus denticulatus*, for low input aquaculture. Honduras (HCPI), October 2005.
- Bart, A.N., 2004. Contribution of Aquaculture and Aquatic Resources Management (AARM) Program of the Asian Institute of Technology (AIT) to tilapia research. Presented to the Sixth International Symposium on Tilapia in Aquaculture, Bureau of Fisheries and Aquatic Resources at Manila, Philippines, 12–16 September 2004.

- Bart, A. and A. Wahab, 2004. Technological constraints and future of tilapia culture in Bangladesh. Presented to Tilapia Culture in Bangladesh: Constraints and Potentials, at Dhaka Bangladesh, April 2004.
- Bart, A. (presenter) and D.V. Trung. Controlled reproduction of an indigenous herbivorous species, *Spinibarbus denticulatus*, in Southeast Asia. Presented to the International Organic Aquaculture Workshop, at Minneapolis, Minnesota, July 2003.
- Bart, A. Conservation of aquatic biodiversity in Southeast Asia. Seminar, at Burapha University, Chonburi, Thailand, audience consisted of graduates. June 2003.
- Bart, A. Conservation of fish biodiversity. Presented at the Gondol Institute of Marine Culture, Gondol, Bali, Indonesia, 14 March 2003.
- Bart, A. Controlled reproduction of indigenous species to prevent the loss of biodiversity: a case study of herbivorous species *Spinibarbus denticulatus* in Southeast Asia. Presented to the World Aquaculture Society Annual Meeting, at Honolulu, Hawaii, March 2004.
- Bart, A. Research paper writing for publication in international journals in aquaculture and fisheries. 7 day workshop, at Rajandrapur, Bangladesh, Audience included aquaculture and fisheries university faculty from 5 universities, 1–7 February 2003.
- Bart, A. Research proposal writing for external funding in aquaculture and fisheries. 7 day workshop, at Rajandrapur, Bangladesh, audience included aquaculture and fisheries university faculty from 5 universities, 25–31 January 2003.
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## 6. INSTITUTE OF AGRICULTURE AND ANIMAL SCIENCE

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## III. GLOBAL ACTIVITIES

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- Boyd, C.E. Workshop on shrimp pond water quality (2 hr–73 participants), Chantaburi and Surat Thani, Thailand, May 1998.
- Boyd, C.E. Workshop on soil management in shrimp ponds (4 days–32 participants), Guayaquil, Ecuador, August 1997.
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## APPENDIX 5. LINKAGES

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Developing and maintaining links—local, regional, and international—among collaborating universities, government ministries, departments, and agencies, and the private sector forms a significant ancillary contribution to the CRSP research effort and to the goal of meeting food security needs in the developing world. The following list includes informal linkages and connections made by Aquaculture CRSP researchers in the field as well as those maintained by the Program Management Office.

- Acuarios Leticia, Colombia
- Alabama Catfish Producers Association, Montgomery, Alabama
- Alaska State University
- Alpha Aquaculture, Kenya
- American Association for the Advancement of Science (AAAS), Washington, DC
- American Association of State Colleges & Universities
- American Fisheries Society, Bethesda, Maryland
- American Red Cross
- American Tilapia Association, Arlington, Virginia
- Aqua Technics, Carlsborg, Washington
- Aquacorporacion, International, Honduras
- Aquaculture for Local Community Development Programme (ALCOM), Harare, Zimbabwe
- Aquaculture Network for Africa (ANAF)
- Aquaculture Research Unit, University of the North, Peitersburg, South Africa
- Aquaculture without Frontiers
- Arid & Semi-Arid Lands (ASAL) Project, Government of Kenya, Laikipia, Kenya
- Asian Development Bank, Tarahara, Nepal
- Asian Institute of Technology, Thailand
- Asociación Nacional de Acuicultores de Honduras (ANDAH), Tegucigalpa, Honduras
- Association for International Agriculture & Rural Development (AIARD), Washington, DC
- Auburn University, Alabama
- Australian Center for International Agricultural Research (ACIAR), Nelson Bay, Australia
- Bangladesh Agricultural University (BAU), Mymensingh, Bangladesh
- Bangladesh Rural Advancement Committee (BRAC), Bangladesh
- Bean/Cowpea CRSP, East Lansing, Michigan
- Bemidji State University, Minnesota
- Board for International Food & Agricultural Development (BIFAD) Washington, DC
- Brackish Water Shrimp Culture Station, Thailand
- Broadening Access & Strengthening Input Market Systems (BASIS) CRSP, Madison, Wisconsin
- Brooklyn College, New York
- Brunell Engineering Works, Kenya
- Bunda College of Agriculture, University of Malawi, Lilongwe, Malawi
- Bureau of Fisheries & Aquatic Resources (BFAR), Manila, Philippines
- Can Tho University, Vietnam
- Canadian International Development Agency (CIDA), Hull, Quebec, Canada
- Caritas, Bangladesh & Iquitos, Peru
- Central Laboratory for Aquaculture Research (CLAR), Abbassa, Egypt
- Centro de Adiestramiento de la Agricultura Sostenible (CEASO), Honduras
- Centro de Investigación en Alimentación y Desarrollo (CIAD)
- Centro Internacional de Agricultura Tropical (CIAT), Cali, Colombia
- Chiang Mai Rehabilitation Center, Thailand
- Chulalongkorn University, Bangkok, Thailand
- Clackamas County Extension Office, Oregon City, Oregon
- Clemson University, Clemson, South Carolina
- Coastal Resources Center, University of Rhode Island
- Comité para la Defensa y Desarrollo de la Flora y Fauna del Golfo de Fonseca (CODDEFFAGOLFA) Tegucigalpa, Honduras
- Commonwealth Agricultural Bureau (CABI International), Wageningen, Netherlands
- Comunidad Indígena Sarayaku, Ecuador
- Consejo Nacional de Ciencia y Tecnología (CONACYT), Mexico
- Consejo Nacional del Ambiente (CONAM), Lima, Peru



- Consortium for International Earth Science Information Network (CIESIN), Washington, DC
- Consultative Group on International Agricultural Research (CGIAR), Washington, DC
- Cooperative for Relief & Assistance Everywhere (CARE), Bangladesh, Honduras, Peru, & Atlanta, Georgia
- Cornell University, Ithaca, New York
- CP Group, Thailand
- Cruz Aquaculture Corporation, Philippines
- CSIRO Livestock Industries, Chiswick Pastoral Research Laboratory, Armidale, Australia
- Danish International Development Agency (DANIDA), Copenhagen, Denmark
- Dar es Saalam University, Dar es Saalam, Tanzania
- David & Lucile Packard Foundation
- Department for International Development (DFID) Fish Genetics Research Programme, Swansea University, Wales, UK
- Department of Agriculture, Yunnan Province, China
- Department of Aquaculture, Nepal
- Department of Environmental Management, County of Hawai'i
- Department of Environmental Studies, Kenya
- Department of Fisheries, Ministry of Livestock & Fisheries Development, Kenya
- Department of Fisheries, Phnom Penh, Cambodia
- Department of Fisheries, Udorn Thani, Thailand
- Department of Livestock & Fisheries, Savannakhet, Laos
- Department of Soil Science, University of Nairobi, Kenya
- Derby Holding Company, Kenya
- Development for the Municipality of Centro, Tabasco, Mexico
- Dominion Fish Farm, Kenya
- EcoCostas, Ecuador
- Ecuador USAID-Arcoiris
- Egerton University, Njoro, Kenya
- Ejido Rio Playa, Comalcalco, Tabasco, Mexico
- El Carao National Fish Culture Research Center, Honduras
- EMBRAPA Environment, Brazil
- Empresa Brasileira de Pesquisa Agropecuária e Extensão Rural de Santa Catarina (EPAGRI), Brazil
- Empresa Nacional de Energia Eléctrica, Tegucigalpa, Honduras
- Escuela Agrícola Panamericana Zamorano, Honduras
- Escuela de Agricultura de la Región Tropical Humeda (EARTH), San José, Costa Rica
- Escuela Superior Politécnica del Litoral (ESPOL)/ Centro Nacional de Acuicultura e Investigaciones Marinas (CENAIM), Guayaquil, Ecuador
- European Foundation for the Improvement of Living & Working Conditions, Dublin, Ireland
- European Inland Fisheries Advisory Commission (EIFAC), Rome, Italy
- Extensão Rural de Santa Catarina (Epagri), Brazil
- Farm-Level Applied Research Methods for East & Southern Africa (FARMESA)/ Swedish International Development Cooperation Agency (SIDA)/, Stockholm, Sweden
- Fe y Alegría, Lima, Peru
- Federación de Agroexportadores de Honduras (FPX), San Pedro Sula, Honduras
- Fideicomisos Institutos en Relación con la Agricultura (FIRA), Morelia, Michoacán, Mexico
- Fisheries Department, Ministry of Food & Agriculture, Ghana
- Fisheries Department, Kenya
- Fisheries Industry Technology Center/University of Alaska Kodiak & University of Alaska Fairbanks Sea Grant Marine Advisory Program
- Fisheries Society of Africa (FISA), Nairobi, Kenya
- Florida International University, USA
- Fondo Nacional de Desarrollo Pesquero (FONDEPES), Lima, Peru
- Food & Agriculture Organization of the United Nations (FAO), Italy
- Foreign Agricultural Service, Research & Scientific Exchange Division
- Forum for Organic Resource Management (FORMAT), Nairobi, Kenya
- French Red Cross, France
- Fundación Ecológica Arcoiris, Ecuador
- FYD International, Philippines
- General Directorate of Fisheries & Aquaculture (DIGEPESCA), Tegucigalpa and San Pedro Sula, Honduras
- Genetically Improved Farmed Tilapia Program (GIFT), Muñoz, Nueva Ecija, Philippines
- German Development Service, Kenya
- Global Aquaculture Alliance, St. Louis, Missouri
- Global Livestock CRSP, Davis, California
- Global Village, Honduras
- Global Water Sustainability, Florida
- Growel Formulations Pvt. Ltd, India
- Hainan University, China
- Heifer International, Arkansas
- Henry Spira/GRACE Project on Industrial Production, School of Hygiene & Public Health, Johns Hopkins University

- Hofstra University, USA
- Huazhong Agricultural University, Wuhan, China
- Inland Water Resources & Aquaculture Service (FIRI), Rome, Italy
- Institut Pertanian Bogor (IPB), Bogor, Indonesia
- Institute for Agriculture & Trade Policy, USA
- Institute for Research & Food Development, Mexico
- Institute for the Regional Ecodevelopment of the Amazon, Ecuador
- Institute of Agriculture & Food Information, Prague, Czech Republic
- Institute of Agriculture & Animal Science (IAAS), Tribhuvan University, Rampur Campus, Chitwan, Nepal
- Institution for Research in Food & Development, Hermosillo, Sonora, Mexico
- Instituto Amazónico de Investigaciones Científicas SINCHI, Colombia
- Instituto Colombiano de Desarrollo Rural INCODER, Bogota, Colombia
- Instituto Nacional de Investigaciones Agrícolas, Amazonas, Venezuela
- Instituto de Investigaciones de la Amazonía, Peruana (IIAP), Peru
- Instituto de Investigaciones IMANI, Colombia
- Instituto del Mar del Perú (IMARPE), Peru
- Instituto Nacional de Pesquisas da Amazônia (INPA), Brazil
- Instituto Politécnico Nacional, Mexico
- Instituto Tecnológico Saleciano, Ecuador
- Instituto Tecnológico de Honduras
- Instituto Tecnológico del Mar, Mexico
- Integrated Pest Management CRSP, USA
- Inter-African Committee on Oceanography, Sea & Inland Fisheries
- International Center for Research in Agroforestry (ICRAF), Nairobi, Kenya
- International Development Research Centre (IDRC), Ottawa, Canada
- International Higher Education Linkages Project (IHELP), Washington, DC
- International Institute for Fisheries Economics & Trade (IIFET), USA
- International Service for National Agricultural Research (ISNAR), Honduras
- International Sorghum & Millet (INTSORMIL) CRSP, Lincoln, Nebraska
- International Symposium on Tilapia in Aquaculture (ISTA)
- Japan International Cooperation Agency (JICA), Japan
- Jomo Kenyatta University, Nairobi, Kenya
- Kasetsart University, Thailand
- Katholieke Universiteit Leuven (KUL), Belgium
- Kellogg Foundation, Dominican Republic
- Kenya Fisheries Department, Kenya
- Kenya Marine & Fisheries Research Institute
- Kenya Medical Research Institute (KEMRI), Nairobi, Kenya
- Kenyatta University, Nairobi, Kenya
- Kibos Fish Farm, Kenya
- Kingolwira National Fish Farming Centre, Tanzania
- Kwame Nkrumah University of Science & Technology, Kumasi, Ghana
- La Fundación Chile, Santiago, Chile
- Ladang Fisheries College, Indonesia
- Lake Basin Development Authority, Kenya
- Lake Victoria Environmental Management Programme, Kenya
- Land Tenure Center, Madison, Wisconsin
- Louisiana State University, Baton Rouge, Louisiana
- Magarini Aquafarmers, Malindi, Kenya
- Malawi National Aquaculture Center, Malawi
- Marine Farms ASA, Norway
- Mekong River Commission, Phnom Penh, Cambodia
- Mercy Corps, Portland, Oregon, USA
- Mesta de Bombon Maca Producers Association, Peru
- Michigan State University
- Microcredit Summit Campaign, Washington, DC
- Ministry of Agricultural Development, Panama
- Ministry of Agriculture, Animal Husbandry, & Fisheries, Entebbe, Uganda
- Ministry of Education, Dominican Republic
- Ministry of Environment & Natural Resources, Tegucigalpa, Honduras
- Ministry of Fisheries, Iquitos, Peru
- Ministry of Tourism, Natural Resources, & Environment, Fisheries & Aquaculture Development Division, Dar es Salaam, Tanzania
- Moi University, Kenya
- Mount Kenya Fish Farmers Association, Central Province, Kenya
- Naivasha Wildlife & Fisheries Training Institute, Kenya
- National Agricultural Library, Washington, DC
- National Agricultural Research Council, Nepal
- National Agriculture University (NAU), La Molina, Peru
- National Aquaculture Centre, Zomba, Malawi
- National Center for Genetic Engineering & Biotechnology (BIOTEC), Thailand
- National Council for Science & Technology, Mexico

- National Freshwater Fisheries Technology Center, Philippines
- National Inland Fisheries Institute (NIFI), Bangkok, Thailand
- National Museums of Kenya, Nairobi, Kenya
- National Research Initiative, Thailand
- National Sea Grant College Program
- National Shrimp Culture Advisory Group, Tegucigalpa, Honduras
- National Technical Information Services (NTIS), Springfield, Virginia
- National University of Colombia
- Nature Conservancy's Indo-Pacific Resource Center in Australia
- Nepal Agricultural Research Council, Lalitpur, Nepal
- Network of Aquaculture Centres in Asia-Pacific (NACA), Bangkok, Thailand
- New York Sea Grant
- Nong Nam University, Vietnam
- Noorul Islam College of Engineering, Tamil Nadu, India
- North Carolina State University, Raleigh, North Carolina
- North Central Regional Aquaculture Center (NCRAC), East Lansing, Michigan
- Nuestros Pequeños Hermanos (NPH), Honduras
- Oceanic Institute, Waimanalo, Hawaii
- Oceanol, Centro, Tabasco, Mexico
- Ohio State University Research Foundation (OSURF), Columbus, Ohio
- Oklahoma State University, USA
- Oregon Aquaculture Association – Pond School, USA
- Oregon Sea Grant, Corvallis, Oregon
- Oregon State University, Oregon
- Organization of African Unity, Addis Ababa, Ethiopia
- Patani Fisheries College, Patani, Thailand
- Peace Corps, Ecuador
- Peanut CRSP, Griffin, Georgia
- Population & Fish Genetics Group
- Programa Cooperativo de Investigacion y Transferencia de Tecnologia Agropecuaria para los Tropicos (PROCITROPICS), Peru
- Programa Regional de Apoyo al Desarrollo de la Pesca en el Istmo Centroamericano (PRADEPESCA), Panama
- Project Globale, Honduras
- Project Rural Reconstruction, Santa Barbara, Honduras
- PROMIPAC, Nicaragua and El Salvador
- PROSEAL, Iquitos, Peru
- PROSHIKA, Dhaka, Bangladesh
- Puerto Rico Sea Grant
- Purdue University, Indiana
- Quisqueya University, Haiti
- Red de Desarrollo Sostenible Honduras (RDS-HN), Honduras
- Regional Center of Education & Quality for Sustainable Development (CREDES), Mazatlan, Mexico
- Research Institute for Aquaculture No. 1, Vietnam
- Roche Aquaculture Research Centre Asia Pacific, Bangkok, Thailand
- Royal Institute of Technology, Stockholm, Sweden
- Royal University of Agriculture, Nepal
- Rural Reconstruction Program (PRR), Honduras
- Sagana Fish Farm, Kenya
- Sagana Women's Group, Sagana, Kenya
- Sarasawathi Foundation, Thailand
- Science & Math Investigative Learning Experiences Program (SMILE), Oregon State University, USA
- Secretaria de Agricultura e Abastecimento do Estado de São Paulo, Brazil
- Secretaría de Agricultura y Ganadería, Honduras
- Secretaría Especial de Acuicultura e Pesca, Brazil
- Sichuan Provincial Fisheries Association, Ziyang, Sichuan Province, China
- Sinaloa State Committee for Aquaculture Sanitation (CESASIN)
- Sisaket College of Agriculture & Technology, Thailand
- Socio-Economic Development Centre (SEDEC), Binh Thuan Province, Vietnam
- Soil Management CRSP, Honolulu, Hawaii
- Sokoine University of Agriculture, Tanzania
- Southeast Asian Fisheries Development Center (SEAFDEC), Iloilo, Philippines
- Southeast Asian Outreach (SAO)/Cambodia Aquaculture at Low Expenditure (SCALE) Project, Cambodia
- Southern African Development Community (SADC), Harare, Zimbabwe
- Southern Illinois University at Carbondale
- Southwest University, Chongqing, China
- Special Program for African Agricultural Research (SPAAR), Washington, DC
- Stellenbosch University, South Africa
- Sustainable Agricultural Centre for Research & Development in Africa (SACRED-Africa), Bungoma, Kenya
- Sustainable Agriculture & Natural Resources Management (SANREM) CRSP, Watkinsville, Georgia
- Taiwanese Mission, Honduras
- Technical Integration Asia Network, Yangon, Myanmar
- Terra Nuova, Lima, Peru

- Texas A&M University, College Station, Texas
- Texas Sea Grant, Houston, Texas
- Texas Tech University, Lubbock, Texas
- Thai Lux, Thailand
- Thailand Department of Fisheries
- The Ohio State University, Ohio
- The University of Michigan, Michigan
- Training & Occupation for Disabled Association, Poi Pet, Cambodia
- Uganda Wetlands & Resource Conservation Association (UWRCA), Uganda
- Ujong Batee Aquaculture Research & Extension Center, Indonesia
- United Aqua Farms, Bangladesh
- United States Department of Agriculture (USDA), Washington, DC
- United States Fish & Wildlife Service (USFWS), Washington, DC
- United States Food & Drug Administration (FDA), Washington, DC
- Universidad Autónoma del Beni, Bolivia
- Universidad Autónoma de Sinaloa, Mexico
- Universidad Autónoma Metropolitana, Mexico City, Mexico
- Universidad Centroamericana, Nicaragua
- Universidad de Santiago de Compostela, Santiago, Spain
- Universidad Juárez Autónoma de Tabasco, Mexico
- Universidad Mayor de San Simón, Bolivia
- Universidad Nacional Agraria La Molina, Lima, Peru
- Universidad Nacional de Colombia
- Universidad Nacional de la Amazonia Peruana, Peru
- Universidad Nacional Federico Villareal, Lima, Peru
- Universidad Nacional Mayor de San Marcos, Lima, Peru
- Universidad Técnica de Machala, Machala, Ecuador
- Universidade de São Paulo, Brazil
- Universidade Estadual Paulista, Brazil
- Universidade Federal de Minas Gerais, Brazil
- Universidade Federal do Amazonas, Brazil
- Universität Hohenheim, Stuttgart, Germany
- Université Nationale du Rwanda, Butare, Rwanda
- University of Agriculture & Forestry, Vietnam
- University of Alaska, USA
- University of Arizona, USA
- University of Arkansas at Pine Bluff, USA
- University of California–Davis, USA
- University of Delaware, USA
- University of Fisheries, Nha Trang, Vietnam
- University of Georgia, USA
- University of Hawai'i at Hilo, USA
- University of Nairobi, Kenya
- University of Oklahoma, USA
- University of Puerto Rico, Mayaguez, Puerto Rico
- University of Rhode Island, USA
- University of San Carlos, Guatemala
- University of Stirling, UK
- University of Texas at Austin, USA
- University of the North, Pietersburg, South Africa
- University of the Philippines in the Visayas, Iloilo, Philippines
- University of the Virgin Islands, USVI
- University of Wales, Swansea, UK
- University of Washington, USA
- University of Wisconsin–Madison, USA
- Veracruz World Trade Center
- Vincent Foundation, Haiti
- Virginia Polytechnic Institute & State University, USA
- Wageningen University, Netherlands
- West African Rice Development Association (WARDA), Bouaké, Côte d'Ivoire
- Western Regional Aquaculture Consortium (WRAC), Seattle, Washington
- Wetlands Conservation Program, Mazatlán, Mexico
- Winrock International, Lima, Peru
- World Aquaculture Society (WAS), Baton Rouge, Louisiana
- World Aquaculture Society Tsunami Relief Fund (WAS-TRF)
- World Bank, Washington, DC
- World Conservation Union (IUCN), Nairobi, Kenya
- World Neighbors, Honduras
- World Wildlife Fund, Washington, DC
- WorldFish Center (formerly ICLARM), Penang, Malaysia
- Wuhan University, China
- Xiamen University, China
- YSI, Inc.
- Zamorano Alumni Association, Dominican Republic
- Zhejiang University, China



## APPENDIX 6. PROGRAM PARTICIPANTS<sup>8</sup>

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### MANAGEMENT ENTITY OFFICE STAFF

Oregon State University, Corvallis, Oregon USA

Hillary Egna

Director

### UNITED STATES AGENCY FOR INTERNATIONAL DEVELOPMENT

Washington, DC USA

Harry Rea

Cognizant Technical Officer

### ADVISORY BODIES

#### *External Program Advisory Council (membership as of 2008)*

Christine Crawford

Chair, University of Tasmania, Hobart, Australia

Jason Clay

World Wildlife Fund, Washington, DC

Nathanael Hishamunda

FAO, Rome, Italy

Marcia Macomber

CGIAR Challenge Program on Water & Food, Colombo, Sri Lanka

#### *Ex-Officio*

#### *Members*

Harry Rea

USAID

Hillary Egna

Oregon State University

#### *Institutional Representatives*

Patricia R. Alvarez

Florida International University

Roy Arnold

Oregon State University

Linda L. Brainard

Cornell University

Lawrence A. Davis

University of Arkansas at Pine Bluff

Peter J. Gerard

University of Michigan

Barbara A. Goswick

University of Arkansas at Pine Bluff

Colin Kaltenbach

University of Arizona

Ricki McMillan

Institute for Agriculture and Trade Policy

Anne J.M. Moffat

Ohio State University

C. Michael Moriarty

Auburn University

Gordhan L. Patel

University of Georgia

Lee Anne T. Peters

University of Arizona

Prudence M. Rice

Southern Illinois University at Carbondale

Rose Tseng

University of Hawaii at Hilo

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<sup>8</sup> For participant listings within each program year during the 1996–2008 reporting period, see the corresponding Annual Administrative Reports. Listings here cover the period 2007–2008.

***2006–2007 Technical Committee Member Co-Chairs (illustrative of the TC roster for one year)***

Jim Diana	University of Michigan
Claude Boyd	Auburn University

***Material and Methods Subcommittee Research Area of Expertise***

Suyapa Meyer	Zamorano	Social and economic aspects
Yang Yi	Asian Institute of Technology	Environmental effects
Kevin Fitzsimmons	University of Arizona	Production optimization

***Technical Progress Subcommittee***

Kwamena Quagrainie	University of Arkansas	Social and economic aspects
Bill Tollner	University of Georgia	Environmental effects
Maria Haws	University of Hawaii	Production optimization

***Work Plan and Budget Subcommittee***

Nancy Gitonga	Kenya Department of Fisheries	Social and economic aspects
Wilfrido Contreras-Sánchez	UJAT	Environmental effects
Remedios Bolivar	Central Luzon State University	Production optimization

***Ex-Officio Members***

Harry Rea	USAID
Hillary Egna	Oregon State University



## APPENDIX 7. ACRONYMS

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Developing and maintaining linkages among collaborating universities, government, NGOs, and the private sector around the world forms a significant ancillary contribution to the CRSP's research effort and to the goal of meeting food security needs in the developing world. The following list includes informal linkages and connections made by ACRSP researchers in the field as well as those maintained by the Program Management Office.

AAAS	American Association for the Advancement of Science
ACIAR	Australian Center for International Agricultural Research
ACRSP	Aquaculture Collaborative Research Support Program
ADR	Adoption/Diffusion Research
AFCRSP	Aquaculture & Fisheries Collaborative Research Support Program
AIARD	Association for International Agriculture & Rural Development
AIT	Asian Institute of Technology
ALCOM	Aquaculture for Local Community Development Programme
AMR	Administrative Management Review
ANDAH	Asociación Nacional de Acuicultores de Honduras
AO	Agreement Officer (USAID)
ASAL	Arid and Semi-Arid Lands Project
ASF	Animal Source Foods
ASMR	Aquaculture Systems Modeling Research
ATA	American Tilapia Association
ATR	Appropriate Technology Research
AU	Auburn University
BASIS	Broadening Access & Strengthening Input Market Systems CRSP
BAU	Bangladesh Agricultural University
BIFAD	Board for International Food & Agriculture Development
BIOTEC	National Center for Genetic Engineering & Biotechnology
BOD	Biochemical oxygen demand
BOD	Board of Directors
BRAC	Bangladesh Rural Advancement Committee
CARE	Cooperative for Relief & Assistance Everywhere
CAS	College of Agricultural Sciences, OSU
CEASO	Centro de Adiestramiento de la Agricultura Sostenible
CENAIM	Centro Nacional de Acuicultura e Investigaciones Marina
CESASIN	Sinaloa State Committee for Aquaculture Sanitation
CF	Condition factor
CFS	China Society of Fisheries
CGIAR	Consultative Group on International Agricultural Research
CIAT	Centro Internacional de Agricultura Tropical
CIDA	Canadian International Development Agency
CIESIN	Consortium for International Earth Science Information Network
CIFAD	Consortium for International Fisheries & Aquaculture Development
CIO	Conflict of Interest
CLAR	Central Laboratory for Aquaculture Research
CLSU	Central Luzon State University
CODDEFFAGOLF	Committee for the Defense & Development of the Flora & Fauna of the Gulf of Fonseca
CONACYT	Consejo Nacional de Ciencia y Tecnología
CONAM	Consejo Nacional del Ambiente
CREDES	Regional Center of Education & Qualification for Sustainable Development

CRSP	Collaborative Research Support Program
CSIRO	Commonwealth Scientific & Industrial Research Organisation
CTO	Cognizant Technical Officer
DANIDA	Danish International Development Agency
DBT	Database Task Force
DFID	Department for International Development, Fish Genetics Research Programme, Swansea University
DIGEPESCA	General Directorate of Fisheries & Aquaculture
DO	Dissolved oxygen
DOF	Department of Fisheries
DTAP	Development Themes Advisory Panel(s)
E2	Estradiol
EARTH	Escuela de Agricultura de la Region Tropical Humeda
EEP	External Evaluation Panel
EGAT	Bureau for Economic Growth, Agriculture, & Trade (USAID)
EIFAC	European Inland Fisheries Advisory Commission
EIP	Emerging Issues Panel
EMBRAPA	Empresa Brasileira de Pesquisa Agropecuária
EPAC	External Program Advisory Council
ER	Effluents & Pollution Research
ESPOL	Escuela Superior Politécnica del Litoral
FAO	Food & Agriculture Organization, United Nations
FARMESA	Farm-Level Applied Research Methods for East & Southern Africa
FDA	United States Food & Drug Administration
FFR	Feeds & Fertilizers Research
FIRI	Inland Water Resources & Aquaculture Service
FISA	Fisheries Society of Africa
FIU	Florida International University
FONDEPES	Fondo Nacional de Desarrollo Pesquero
FORMAT	Forum for Organic Resource Management
FPX	Federación de Agroexportadores de Honduras
FSR	Food Security Research
FTE	Full-Time Equivalent
GAFY	Gross annualized fish yield
GIFT	Genetically Improved Farmed Tilapia
GIS	Geographic Information System
GISR GIS:	Planning, Policy, & Global Data Analysis Research
HACCP	Hazard Analysis & Critical Point Control
HC	Host Country
HSI	Hepatosomatic index
HTML	Hypertext Markup Language
IAAS	Institute of Agriculture & Animal Science
IARC	International Agricultural Research Center(s)
IATP	Institute for Agriculture & Trade Policy
IARC	International Agricultural Research Center(s)
ICLARM	International Center for Living Aquatic Resources Management (now WorldFish Center)
ICRAF	International Center for Research in Agroforestry
IDRC	International Development Research Centre
IEE	Initial Environmental Examination
IEHA	Initiative to End Hunger in Africa
IHELP	International Higher Education Linkages Project
IIAP	Instituto de Investigaciones de la Amazonia Peruana
IIFET	International Institute for Fisheries Economics & Trade
IGF-1	Insulin-like growth factor 1
IMANI	Instituto de Investigaciones, Colombia
IMARPE	Instituto del Mar del Perú



IMNC	Information Management & Networking Component
INCODER	Instituto Colombiano de Desarrollo Rural
INPA	Instituto Nacional de Pesquisas da Amazonia
INTSORMIL	Sorghum, Millet & Other Grains CRSP
IPB	Institut Pertanian Bogor, Indonesia
IPM	Integrated Pest Management
ISTA	International Symposium on Tilapia in Aquaculture
IR	Institutional Representative(s)
IUCN	World Conservation Union
IWMI	International Water Management Institute (an IARC)
JCARD	Joint Committee on Agricultural Research & Development
JICA	Japan International Cooperation Agency
LHRHa	Luteinizing hormone-releasing hormone analog
LIFD	Low-income food-deficit
LOE	Level of Effort
ME	Management Entity
MEAR	Marketing & Economic Analysis Research
MOU	Memorandum of Understanding
MRC	Mekong River Commission
MSU	Michigan State University
MSY	Maximum Sustainable Yield
MT	17 $\alpha$ -methyltestosterone
NACA	Network of Aquaculture Centres in Asia-Pacific
NAR	Net annualized revenue
NARS	National Agricultural Research System (of Host Countries)
NASULGC	National Association of State Universities & Land-Grant Colleges
NAU	National Agriculture University
NB	Nota Bene
NCRAC	North Central Regional Aquaculture Center
NGO	Nongovernmental organization
NIFI	National Inland Fisheries Institute
NOAA	National Oceanographic & Atmospheric Administration (US)
NPH	Nuestros Pequeños Hermanos
NSR	New Aquaculture Systems/New Species Research
OhSU	The Ohio State University
OSU	Oregon State University
OSURF	Ohio State University Research Foundation
ACRSP	Aquaculture CRSP
PDF	Portable Document Format
PDR	Pond Dynamics Research
PDVR	Product Diversification Research
PI	Principal Investigator
PMO	Program Management Office
PPEC	Proposal Planning Executive Committee
PRADEPESCA	Programa Regional de Apoyo al Desarrollo de la Pesca en el Istmo Centroamericano
PROCITROPICS	Programa Cooperativo de Investigación y Transferencia de Tecnología Agropecuaria para los Trópicos
PRR	Rural Reconstruction Program
PU	Purdue University
RCE	Regional Center(s) of Excellence
RCR	Reproduction Control Research
RDSHN	Red de Desarrollo Sostenible Honduras
RFA	Request for Assistance
RFP	Request for Proposals
ROI	Return on investment
SANREM	Sustainable Agriculture & Natural Resource Management CRSP
SACRED	Sustainable Agricultural Centre for Research & Development in Africa

SADC	Southern African Development Community
SAO	Southeast Asian Outreach
SEAFDEC	Southeast Asian Fisheries Development Center
SEDEC	Socio-Economic Development Centre
SIDA	International Development Cooperation Agency
SIUC	Southern Illinois University at Carbondale
SINCHI	Instituto Amazónico de Investigaciones Científicas
SMILE	Science & Math Investigative Learning Experiences Program
SPAAR	Special Program for African Agricultural Research
SPARE	Strategic Partnership for Agricultural Research & Education
SRP	Soluble reactive phosphorus
TA	Technical Application
TA	Trenbolone acetate
TAN	Total ammonia nitrogen
TC	Technical Committee
TIPS	Tilapia Integration to Prawn Culture System
TN	Total nitrogen
TP	Total phosphorus
TS	Total solids
TSP	Triple superphosphate
TSS	Total suspended solids
UA	University of Arizona
UAPB	University of Arkansas at Pine Bluff
UCD	University of California, Davis
UG	University of Georgia
UH	University of Hawaii
UJAT	Universidad Juárez Autónoma de Tabasco
UM	The University of Michigan
UO	University of Oklahoma
US	United States
USAID	United States Agency for International Development
USDA	United States Department of Agriculture
USFWS	United States Fish & Wildlife Service
USVI	University of the Virgin Islands, St. Thomas
UT	University of Texas
UV	Ultraviolet
UWRCA	Uganda Wetlands & Resource Conservation Association
VSS	Volatile suspended solids
WARDA	West African Rice Development Association
WAS	World Aquaculture Society
WIDeST	Web-Based Information Delivery System for Tilapia
WRAC	Western Regional Aquaculture Consortium
WWF	World Wildlife Fund
YSI	YSI Inc.