AQUACULTURE REGIONAL EXTENSION FACILITATOR

Principal Investigator: Fred P. Binkowski, University of Wisconsin System/University of Wisconsin-Milwaukee Great Lakes WATER Institute

Industry Advisory Council Liaison: Forrest Williams, Bay Port, Michigan

Extension Liaison: Joseph Morris, Iowa State University

Funding Request: $100,000

Duration: 2 years (September 1, 2003- August 31, 2005)

Objectives:

1. Develop communication strategies for the region, i.e., hotline, list server.
2. Support state aquaculture associations.
3. Develop a resource matrix.
4. Organize regional conferences—proceedings/publications.
5. Information needs assessment of producers.

Proposed Budgets:

Institution	Principal Investigator	Objec-tive(s)	Year 1	Year 2	Total
University of Wisconsin-Milwaukee/WATER Institute	Fred P. Binkowski	1-5	$50,000	$50,000	$100,000
Totals			**$50,000**	**$50,000**	**$100,000**

TABLE OF CONTENTS

JUSTIFICATION

Aquaculture related business in the North Central Region (NCR) continues to be an emerging industry. Private aquaculture in the NCR has an estimated farm-gate value of more than $70 million. The NCR is home to approximately 25% of the U.S. population that consumes almost one billion pounds of seafood products per year; however, the commercial aquaculture industry in the NCR produces less than 2% of all the U.S. production. This raises the obvious question: What are the constraints that are limiting aquaculture production within the NCR? Without assigning a priority order, one can assume that the following topics/issues are representative of some of the primary constraints that could have an influence on increased growth and production: new technology, regulation, education and training, and financial assistance.

Growth in the NCR's aquaculture industry mirrors, and is driven by, broader U.S. and worldwide transitions in the seafood industry. The percentage of seafood from wild fisheries is near or above their sustainable capacity (Lemonick 1994; Meyers et al. 1995), and a steadily increasing percentage of seafood in the U.S. and worldwide comes from fish farming (NMFS 1999; FAO 2000). World aquaculture production has more than doubled since 1984, and reached 28,808,414 metric tons in 1997. World population is projected to reach 8.5 billion by 2025. Based on a worldwide per capita annual consumption of 13 kg of seafood, an additional 55 million tons more than the estimated sustainable harvest from ocean fisheries will be needed to feed the world's expanding population (Anonymous 2000). The bulk of these 55 million tons will have to be supplied through aquaculture. Aquaculture is now the source of one out of three fish consumed by people worldwide (Anonymous 2001). Increased aquaculture production can provide significant health benefits, because fish provide a low fat healthful alternative to many other types of meat. Per capita seafood consumption in the U.S. has hovered at approximately 6.7 kg (15 lb) per person over the last decade. The value of U.S. aquaculture production has grown by roughly 5–10% each year during the past decade, and aquaculture is regarded as the fastest growing segment of U.S. agriculture. Fish are now farmed in every state and territory in the United States. Total annual U.S. aquaculture production is approximately 350,000 metric tons valued at $934 million (NMFS 1999). Nevertheless, a wide disparity exists between domestic aquaculture production and demand, as indicated by a record breaking $6.5 billion 1999 U.S. seafood trade deficit (Sea Food Report 2000; U.S. Census Bureau 2001). This trade deficit as a function of aquaculture product imports again raises the question: What are the constraints that are limiting aquaculture production in the U.S. and more specifically the NCR, and what action is needed to address this problem?

In formulating the North Central Regional Aquaculture Center (NCRAC) strategic plan (NCRAC 1999), it was agreed that closer links are needed among researchers, extension personnel, and producers. It also was recognized that

> ...the general public in the North Central states is unaware of aquaculture. This is reflected in aquaculture's lack of influence around policy issues impacting the industry and producers' frequent inability to obtain capital from financial institutions. In some states in the region, traditional agricultural interests have lined up against aquaculture, as have some states' natural resource agencies. Aquaculture's image in the NCR is largely misunderstood, frequently misperceived, and virtually invisible as compared to some other U.S. regions. The persistence of this poorly defined image will perpetuate missed opportunities for funding, coalition building, and influencing policy makers as well as impacting future generations.

The minimal number of aquaculture extension personnel in the NCR has had a significant impact on the producers both in terms of access to information and direct contact. There is a recognized need for NCRAC to serve as an unbiased information source on the feasibility (both technological and economic) of NCR aquaculture systems and to identify those that are credible. The NCRAC strategic plan suggested that NCRAC should identify "experts" who are unbiased and willing to serve as contacts/information sources regarding "credible" aquaculture. NCRAC has and will continue to play a significant role in developing the best mechanisms for technology transfer, delivering informational resources, and utilizing the aquaculture network to maintain and deliver these critical services to the aquaculture industry.

The strategic plan also asserted that there has been a lack of cohesiveness between the industry and the academic community as well as within the academic community. Many within the industry and the university (research and extension) community perceive that they do not have sufficient opportunity to be fully engaged in NCRAC activities and decision making processes and are unclear about their potential roles and responsibilities for building a successful NCR aquaculture industry. Many state associations are neither well organized nor representative of the aquaculture industry. There are only tentative connections between producers, state agencies, and university research and extension personnel.

To reduce these problems it was proposed at the 2002 NCRAC annual planning meeting that an aquaculture extension facilitator position be established to work with the industry on three specific goals: (1) assist in relationship building with established commercial aquaculturists and state aquaculture extension agents, (2) maintain the continuity of regional coordination of NCRAC, and (3) network with other regional research and extension efforts.

RELATED CURRENT AND PREVIOUS WORK

NCRAC's strategic plan was formulated to assist the Center to more effectively identify and implement research and extension programs to enhance benefits to the NCR (NCRAC 1999). NCRAC's mission is to enhance aquaculture through education, research, and technology transfer to support a sustainable, profitable industry throughout the NCR. Essential to accomplishing this mission is building a North Central aquaculture community representing a partnership among the industry, universities, and public agencies. NCRAC's mission will be accomplished by: developing transferable technology enabling producers to be profitable; disseminating relevant educational materials to achieve profitable margins of operation; providing demonstrations and regular aquaculture extension programs; engaging in research partnerships among industry, universities, and public agencies; and fostering open dialogue and networking throughout the North Central aquaculture community.

Extension efforts have, since the beginning of the RAC programs, been an essential component in NCRAC's mission. In spite of limited personnel, NCRAC extension has been the primary conduit for the dissemination of NCRAC research findings. An outreach education component is usually integrated into each research proposal to assess project results related to the aquaculture industry. As an example, the function of extension liaisons is to participate in writing annual progress and termination reports as well as assisting in the implementation of extension objectives in each research project. In 1992, multiple extension liaisons were appointed to all NCRAC-funded research projects. The increased number of extension liaisons has helped to improve the information transfer from research work groups to the public. Extension liaisons have also assisted with the planning, awareness, promotion, and implementation of the hybrid striped bass, walleye, and yellow perch workshops held throughout the region, and have supported the NCRAC Economics and Marketing Work Group's efforts to develop cost of production budgets and expected revenues for selected NCR species.

Through outreach education, NCRAC Extension can be a core component of the development of a long-term, economically and environmentally sound aquaculture industry. NCRAC Extension (Swann and Morris 2001) has conducted a variety of needs-based educational programs that are not based on NCRAC research. NCRAC-sponsored workshops, fact sheets, technical bulletins, and videos have served to inform a variety of clients about numerous aquaculture practices for the NCR. In a 1994 survey, NCRAC extension contacts estimated that NCRAC publications were used to address approximately 15,000 client questions annually. These fundamental services were in response to a needs assessment of persons interested in Midwest aquaculture.

Prior to mid-1994, little coordination of international aquaculture information sharing existed. Information produced by national and international agencies could only be obtained by contacting the respective sources of this information. Also, individual Cooperative Extension Service personnel relied heavily on information produced by individual states or through regional cooperative projects. As Internet access extended beyond educational institutions and government agencies, a clear need developed to utilize the Internet to reach a much broader audience. In the age of "information overload" the need for a centralized gateway to the ever-increasing number of aquaculture resources in electronic format was apparent (Swan and Morris 2001).

The development of the Aquaculture Network Information Center (AquaNIC) has been instrumental in reaching the public with valuable and timely information. It has been funded, in part, by NCRAC and currently has over 60,000 contacts per year from more than 89 countries. AquaNIC receives direction from a national steering committee of representatives from public and private sector aquaculture. AquaNIC began as a Gopher Server in July 1994 and moved to the World Wide Web server in January 1996.

AquaNIC (currently http://aquanic.org) houses more than 8,000 extension publications, government documents, image files, comprehensive e-mail lists, newsletters, calendars, job announcements, and resumes. It is a gateway to the world's electronic resources in aquaculture including the Regional Aquaculture Centers. It serves as the home of NCRAC's Web site that provides electronic versions of NCRAC extension publications (fact sheets and technical bulletins), directories, the operations manual, and newsletters.

AquaNIC is a wonderfully ambitious, broad based, and inclusive resource network. This worldwide inclusiveness presents a formidable task in topical organization and maintenance of the timeliness and quality of the information available. "Information overload" is an apt expression for describing the problem confronting the Internet

user in navigating electronic resources. Rapid availability can't substitute for critical evaluation of relevance and credibility of information resources whether the source is verbal, printed, or via computer monitor. "Buyer beware" applies here. Extension/outreach programs can be an independent voice to assist aquaculture information users in this regard.

Matching regional user needs to credible and relevant resources requires a clear recognition of industry needs and a focused subset of reliable resources. This is the intent of developing a "resource matrix" as discussed at the 2002 NCRAC planning meeting. A resource matrix will match specific resources to particular needs that could be delivered either by Internet, phone, or printed means.

Currently existing extension/outreach programs for delivering aquaculture information and technology to the emerging NCR aquaculture industry are limited and overextended. In part due to the limited availability of personnel, there has been an emphasis on delivering extension services through printed material, Web sites, lectures, and conferences. In addition to these more "impersonal" means of information transfer, practicing aquaculturists have expressed a need for hands-on training, specialized workshops, and the on-site and interactive guidance of experienced aquaculture specialists. Providing quality technical assistance in all aspects of aquaculture is critical to enhance the positive momentum that the NCR aquaculture industry is exhibiting. The transfer of technology to practicing fish farmers requires an effective communication bridge between university researchers, government agencies, and the public. This will be one of the primary goals of the NCRAC Aquaculture Regional Extension Facilitator (AREF). The principal investigator (PI) has been involved in aquaculture outreach efforts since the mid-1980s. The Wisconsin outreach program has been a principal source of information, guidance, and technical assistance to the developing aquaculture industry in Wisconsin and the surrounding region. Several thousand people have attended aquaculture conferences, specialized workshops, hands-on training sessions, lectures, and received on-site assistance and information resources.

With the growth of the aquaculture industry in the NCR, a new demand and broader market for all kinds of technical information and aquacultural services has evolved. Providing quality technical assistance in all aspects of aquaculture is critical to enhance the positive momentum that the region's aquaculture industry is exhibiting. As novices enter aquaculture, they seek guidance from knowledgeable and experienced persons, commonly from state and federal agencies. Experienced aquaculturists need updated information on new research findings and access to alternative rearing techniques. The need for more public outreach by aquaculture specialists and researchers is increasingly apparent. The needs and requirements of novice and practicing aquaculturists are so multifaceted that careful screening is required. Appropriate response depends on the client's stage of development in aquaculture activity. Initial inquiries can usually be answered with prepared pamphlets, bibliographies, Web pages posting answers to frequently asked questions (FAQs), and providing links to appropriate resource information. These impersonal methods can provide general answers and provide a broader view of enterprising possibilities. This type of general request is the easiest to respond to and requires less time. Follow-up requests and more specialized questions require greater time and advanced materials preparation related to specialized topics and problems. Person-to-person telephone conversations and on-site visits are often critical to meet this type of client request. This approach maximizes user/presenter interaction.

NCRAC also has played a continuing and important role in organizing regional aquaculture conferences that facilitate participation and networking of regional aquaculturists for information exchange and organizational development that can improve the political effectiveness and public recognition of aquaculture in the NCR.

The degree of development of state aquacultural associations reflects and reinforces their state's aquaculture industry development. Based on the results of the 1998 Census of Aquaculture, states having strong state aquaculture associations have the largest aquaculture industries in the region. Within the NCR, Missouri had the highest farm-gate vale at $5,374,000 (17% of the total), followed closely by Wisconsin at $3,221,000 (11% of the total), and Minnesota at $3,221,000 (11% of the total). The combined farm-gate value of these three states was $13,821,000 or 46% of the region's total; these states also have strong viable aquaculture associations. By strengthening the involvement with state associations, the AREF program has the potential to both enhance established state aquaculture industries, as well as serving as a catalyst for aquaculture development in the NCR.

ANTICIPATED BENEFITS

The AREF program will provide an effective mechanism for technology transfer to enhance regional production methodologies. The program will streamline the dissemination of technical bulletins, fact sheets, bibliographies, "how to" manuals, and other pertinent literature. The extension facilitator will enhance NCRAC's outreach program by improving lines of communication among NCRAC researchers, the aquaculture associations, and the regional aquaculture industry. AREF program clientele will have improved access to information of direct use to their enterprises. Through the joint effort of the U.S. Department of Agriculture/NCRAC,

the University of Wisconsin System/University of Wisconsin-Milwaukee Great Lakes WATER Institute, and the U.S. Department of Commerce/University of Wisconsin Sea Grant Institute, we expect to deliver the necessary services in a timely and cost effective fashion to the NCR aquaculture industry.

OBJECTIVES

1. Develop communication strategies for the region, i.e., hotline, list server.

2. Support state aquaculture associations.

3. Develop a resource matrix.

4. Organize regional conferences—proceedings/publications.

5. Information needs assessment of producers.

PROCEDURES

With a new position of aquaculture regional extension facilitator we propose to expand beyond the framework of our existing aquaculture extension/outreach program at the University of Wisconsin Great Lakes WATER Institute (UWGLWI). This expanded effort will include continued collaboration with the University of Wisconsin Sea Grant Institute. Services and resources of the UW Sea Grant Marine Advisory Services and Communication programs will be made available for this project. In addition, scientists and technical staff at the UWGLWI will be organized as a multidisciplinary team of experts to provide technical services and information resources to the NCR aquaculture industry. The "expert team" consists of: Information Technology, Engineering, Outreach, Fishery Biology, Limnology, Water Chemistry, Bio-Technology, Aquatic Microbiology, Legal Affairs, etc. The PI will direct the planning and organization of this expanded program. The newly hired NCRAC/AREF will manage this program on a daily basis. We propose to continue and maintain the AREF position to serve the NCR beyond the 2-year NCRAC project budget period. The University of Wisconsin-Milwaukee Graduate School, the University of Wisconsin Sea Grant Institute (UWSGI), and the University of Wisconsin Great Lakes WATER Institute intend to provide support for maintaining this position beginning in September 2005. In all aspects of the proposed objectives of this proposal, the AREF will maintain communication with the Associate Director's Office located at Iowa State University; this will allow for the greatest efficiency in program delivery.

Communication Strategies for the Region (Objective 1)

The goal will be to serve the full variety of aquaculture information requests relevant to NCR aquaculture operation and to provide timely response to critical needs of the NCR aquaculture industry. In cooperation with the UWGLWI's in-house information technology staff, the AREF will develop a variety of communication strategies tailored to both provide an appropriate degree of user/presenter interactiveness and timeliness of response for information requests. These strategies will be linked with and make use of existing aquaculture information sources such as AquaNIC, but will be focused on improving and simplifying access to information and assistance specific to NCR aquaculture industry needs. Using the resource matrix assembled for Objective 3, the AREF will use the communication strategies developed with the UWGLWI information technology staff to make the resources available to regional users.

For emergency requests requiring immediate response, an advisory hotline will be established through which client questions requiring "rapid response" could be directed. For less urgent inquiries, this phone-based system could offer a menu of options to either the AREF or to members of a "Rapid Response Team" of designated experts (academia, government, and private sector) who specialize in the specific field in question. The Rapid Response Team will consist of experts in all areas of aquaculture (fish health, re-circulation engineering, water chemistry, economics, pond management, etc.) who are willing to contribute and participate. The AREF will assemble this team as part of the resource matrix for Objective 3. For clients without Internet or e-mail access, the hotline phone system will also provide a recorded message with a calendar of current events and timely new items relating to aquaculture issues.

For requests requiring a less immediate response, strategies involving Web page based bulletin boards and e-mail list servers will be employed. These options will require less immediate and direct personal involvement of the AREF and "response team" experts, yet still offer some options for user interactivity in communicating their needs. They also offer the critical aspect of allowing "moderated" control of both access to and the organization of the information presented. This feature is essential to avoiding "information overload" and maintaining an independent viewpoint free of commercial bias. In conjunction with activities defined in Objectives 3 and 5, the AREF could serve an important role in organizing the presentation of the resources matrix to focus and direct inquiries to match them to industry needs. Questions and comments will be posted and processed in a timely fashion, followed by responses from those with experience in the field of inquiry. E-mail list servers and Web page based bulletin boards will be set up to open the lines of communication between regional aquaculturists. Access can be restricted or broadened by the moderator to serve the particular issue or topic being addressed. Posted bulletins can be archived and accessed by future users. FAQs will be organized and posted. Users can have options for how they subscribe, from the degree of activity they want to invest through whether or not they want to receive all postings directly, or whether they want sites that archive the posting.

The number and inclusiveness of e-mail list servers and/or Web page based bulletin boards can be adjusted to specific purposes and could be readily modified in response to timely issues. At times only recognized aquaculturists or association leaders will be included for specific issues, conference planning etc., or at other times only those with expertise or experience with a certain topic will be included. Activity on Web pages and list servers can be monitored automatically and survey questions could be asked to assist in identifying industry needs (Objective 5).

Through the implementation of these communication strategies, the AREF will maintain the continuity of regional coordination and build relationships between established aquaculture operators and state aquaculture extension agents.

Support State Aquaculture Associations (Objective 2)

Most of the twelve states in the NCR have state aquaculture associations and State Aquaculture Coordinators. State aquaculture associations hold regular membership meetings, publish newsletters, and some of them hold or co-sponsor state aquaculture conferences. These associations provide an existing infrastructure for assessing the needs and concerns of the regional industry. The AREF will establish and maintain communication with current state aquaculture association leaders (board members, association officers, executive committee members) keeping abreast of the current activities and issues that are of concern to their memberships, and facilitating and coordinating communication among the various state associations. NCR State Associations have designated representatives (or designated substitutes) on the NCRAC Industry Advisory Council. On a quarterly basis these representatives will be invited to participate in conference calls arranged by the AREF, encouraging interaction and discussion between the state associations. The AREF will announce these calls and distribute a specific agenda that will include such topics and activities as: current and newly emerging issues, prospective regulatory issues, discussion of NCRAC white papers, and planning coordination of industry participation in the annual NCRAC planning meeting. This forum will also enable the AREF to obtain current information on changing industry needs (Objective 5). The AREF will maintain current contact information and directories of association officers and membership, and support the associations by providing current updates on regulatory issues, significant research findings, and upcoming events of interest within the NCR. AREF Web page based bulletin boards and email list servers (Objective 1) will be employed to communicate the summarized content of the conference calls and to develop a link to state association information.

In order to limit travel expenses, telephone and e-mail correspondence with the designated state association representative will be the principal contact between the AREF and the state associations. The AREF will attend three to four association membership meetings and activities per year in person, and will assist state associations in planning their program topics, in contacting potential speakers, and to communicate with their membership regarding NCRAC extension and research activities.

Aquaculture interests of the NCR state associations and industries overlap with the broader regional perspective of the National Association of State Aquaculture Coordinators and the Great Lakes Sea Grant Network. To provide regional communication and industry support, the AREF will develop relationships with these broader based organizations and attend their meetings to both represent an NCR perspective and bring back the broader regional and national perspective to the respective NCR state associations. Each state within the region has a designated aquaculture coordinator(s). The AREF will develop interactions with these individuals and cooperatively provide a broad spectrum of aquaculture services to the regional associations and industry, matching the needs of aquaculturists within the inland sector of the NCR and the Great Lakes states of the NCR with the best and broadest spectrum of aquaculture services. These efforts will enhance regional coordination of aquaculture development and provide networking between NCRAC and other research and extension efforts.

Develop a Resource Matrix (Objective 3)

The AREF will assemble a multi-axis matrix of resource materials focused on recognized needs and goals specific to NCR aquaculture. The resources will be classified by topics relevant to regional user needs and the type of resources available. One axis will classify the resources according to the species being reared. This species listing will indicate each species' relative importance within the NCR. A second axis will classify materials according to topics, such as rearing methodologies, business startup, marketing, environmental and regulatory issues, etc. A third axis will classify the resources by media type (e.g. printed, Web site link, compact disc, video, a regional expert or advisory contact, etc.). The AREF's major activity will be to identify and evaluate available resources, their current relevance, and the need for new resources for each of the matrix cells. In addition to classifying the aquaculture information resources there will be explanations of how to acquire each item and/or how to contact the person referred to. The resource matrix will streamline and focus access to available information and provide a key to the width and breadth of resources available throughout the NCR. It will facilitate obtaining information that may cross over state lines, and will assist both producers and extension personnel in finding appropriate resources to answer their needs. Through interaction with the UWGLWI information technology staff the AREF will provide access to this resource matrix using the communication strategies developed in Objective 1. Information concerning the NRC resource matrix will be disseminated in printed and electronic formats to regional users and state extension agents.

Organize Regional Conferences-Proceedings/Publications (Objective 4)

The AREF will plan, organize, and oversee the presentation of a NCR aquaculture conference in cooperation with state associations as cosponsors. The AREF will coordinate the timing and facilities arrangements to insure broad participation and accessibility of the conference site. The AREF will chair the organizational committee for technical sessions and the conference program to ensure that the topics covered address industry needs and that sufficient opportunity is provided for participants to have contact with presenters. Lecture style presentations, poster sessions, or more informal question and answer sessions could be arranged that permit participant questions to be addressed. Depending on the issue being addressed, use of interactive meeting facilitation equipment could be employed as has been done at previous NCRAC meetings to assess audience response and provide audience/presenter interaction. The AREF will organize the compilation of the regional conference handouts, presenter's information, etc. into conference/workshop proceedings that could be made available both to conference participants and at a specific reasonable cost to non-participants who cannot attend. These might include extended abstracts produced by the presenters. Registration fees will be adjusted to cover the expenses of the conference.

The AREF will also cooperate and assist with the planning and arrangements of state or regional workshops led by other state extension contacts or association leaders. The AREF will assist the local leader/organizer in program planning and contacting presenters with specialized expertise and facilitate arrangement for the workshops.

Information Needs Assessment of Producers (Objective 5)

The AREF will identify existing and emerging producer needs through contacts with state associations, state aquaculture coordinators, regional extension agents, and commercial producers themselves. Through relationships with established commercial aquaculturists and state aquaculture extension agents, the AREF will develop a network to promote better understanding of the needs of regional producers. The communication strategies developed for Objective 1 and networking of Objectives 2 and 4, including the quarterly conference calls with association representatives on the Industry Advisory Council will set the stage for more effective assessment of the regional industry needs. Utilizing both electronic communication strategies and more traditional mail questionnaire surveys, the AREF will conduct surveys of regional producers to obtain the most current information on the NCR aquaculture industry needs.

FACILITIES

The UW-Great Lakes WATER Institute will make available the necessary physical resources to conduct the activities of the NCRAC/AREF. This will include commercial-scale aquaculture demonstration systems, research laboratory, classrooms, workshop and conferencing facilities, and aquaculture research park (outdoor ponds, greenhouse, aquaponics, etc.) The scientists and technical staff of the UWGLWI include specialized expertise in: Information Technology, Engineering, Outreach, Fishery Biology, Limnology, Water Chemistry, Aquatic Microbiology, Legal Affairs, etc. that are available in-house as resources to interact with the NCRAC regional facilitator. UWGLWI has access to UW-Milwaukee computing facilities to support the list server and Web page based communications described in Objective 1. In addition, the UWSGI will continue to be an active partner in our aquaculture program through its Communications, Information Technology, and Advisory Services programs. The Advisory Services program consists of eight specialists and support staff who are located in Madison and in four field offices in coastal communities on

Lake Michigan and Lake Superior. Specialists are in direct contact with their constituents and provide for a two-way flow of information. The Communications and Information Technology programs provide staff with expertise in dissemination of information to the scientific community and the public. UWSGI also produces an award-winning Web site that highlights their research, outreach, and education activities.

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PROJECT LEADER

State	Name/Instituttion	Area of Specialization
Wisconsin	Fred P. Binkowski	Fish Biology/ Aquaculture

PARTICIPATING INSTITUTION AND PRINCIPAL INVESTIGATOR

University of Wisconsin System/University of Wisconsin-Milwaukee Great Lakes WATER Institute

Fred P. Binkowski

BUDGET

ORGANIZATION AND ADDRESS
University of Wisconsin System/University of Wisconsin-Milwaukee
Great Lakes WATER Institute
600 E. Greenfield Ave., Milwaukee, WI 53204

PROJECT DIRECTOR(S)
Fred P. Binkowski

USDA AWARD NO. Year 1: Objectives 1-5

	CSREES FUNDED WORK MONTHS			Duration Proposed Months: 12 **Funds Requested by Proposer**	Duration Proposed Months: _____ **Funds Approved by CSREES** (If different)	Non-Federal Proposed Cost-Sharing/ Matching Funds (If required)	Non-federal Cost-Sharing/ Matching Funds Approved by CSREES (If Different)
A. Salaries and Wages	Calendar	Academic	Summer				
1. No. of Senior Personnel							
a. ____ (Co)-PD(s)							
b. Senior Associates							
2. No. of Other Personnel (Non-Faculty)							
a. ____ Research Associates-Postdoctorates							
b. 9 Other Professionals	9.0			$29,997			
c. ____ Paraprofessionals							
d. ____ Graduate Students							
e. ____ Prebaccalaureate Students							
f. ____ Secretarial-Clerical							
g. ____ Technical, Shop and Other							
Total Salaries and Wages →				$29,997	$0	$0	$0
B. Fringe Benefits (If charged as Direct Costs)				$9,749			
C. Total Salaries, Wages, and Fringe Benefits (A plus B) →				$39,746	0	$0	$0
D. Nonexpendable Equipment (Attach supporting data. List items and dollar amounts for each item.)							
E. Materials and Supplies				$3,127			
F. Travel				$5,127			
G. Publication Costs/Page Charges							
H. Computer (ADPE) Costs							
I. Student Assistance/Support (Scholarships/fellowships, stipends/tuition, cost of education, etc. Attach list of items and dollar amounts for each item.)							
J. All Other Direct Costs (In budget narrative, list items and dollar amounts and provide supporting data for each item.)				$2,000			
K. Total Direct Costs (C through I) →				$50,000	0	$0	$0
L. F&A/Indirect Costs. (If applicable, specify rate(s) and base(s) for on/off campus activity. Where both are involved, identify itemized costs in on/off campus bases.)							
M. Total Direct and F&A/Indirect Costs (J plus K) →				$50,000	0	$0	$0
N. Other →							
O. Total Amount of This Request →				$50,000	0	$0	$0

P. Carryover -- (If Applicable) **Federal Funds: $** **Non-Federal funds: $** **Total $**

Q. Cost Sharing/Matching (Breakdown of total amounts shown in line O)		
Cash (both Applicant and Third Party) →		
Non-Cash Contributions (both Applicant and Third Party) →		

NAME AND TITLE (Type or print)	**SIGNATURE** (required for revised budget only)	**DATE**
Project Director		
Authorized Organizational Representative		

Signature (for optional use)		

Form CSREES-2004 (12/2000)

BUDGET

ORGANIZATION AND ADDRESS	USDA AWARD NO.	Year 2: Objectives 1-5			
University of Wisconsin System/University of Wisconsin-Milwaukee Great Lakes WATER Institute 600 E. Greenfield Ave., Milwaukee, WI 53204		Duration Proposed Months: 12 **Funds Requested by Proposer**	Duration Proposed Months: _____ **Funds Approved by CSREES** (If different)	Non-Federal Proposed Cost-Sharing/ Matching Funds (If required)	Non-federal Cost-Sharing/ Matching Funds Approved by CSREES (If Different)
PROJECT DIRECTOR(S) Fred P. Binkowski					

	CSREES FUNDED WORK MONTHS						
A. Salaries and Wages							
1. No. of Senior Personnel	Calendar	Academic	Summer				
a. ____ (Co)-PD(s)							
b. Senior Associates							
2. No. of Other Personnel (Non-Faculty)							
a. ____ Research Associates-Postdoctorates . . .							
b. 9 Other Professionals	9.0			$29,997			
c. ____ Paraprofessionals							
d. ____ Graduate Students							
e. ____ Prebaccalaureate Students							
f. ____ Secretarial-Clerical							
g. ____ Technical, Shop and Other							
Total Salaries and Wages →				$29,997	$0	$0	$0
B. Fringe Benefits (If charged as Direct Costs)				$9,749			
C. Total Salaries, Wages, and Fringe Benefits (A plus B) →				$39,746	0	$0	$0
D. Nonexpendable Equipment (Attach supporting data. List items and dollar amounts for each item.)							
E. Materials and Supplies				$3,127			
F. Travel				$5,127			
G. Publication Costs/Page Charges							
H. Computer (ADPE) Costs							
I. Student Assistance/Support (Scholarships/fellowships, stipends/tuition, cost of education, etc. Attach list of items and dollar amounts for each item.)							
J. All Other Direct Costs (In budget narrative, list items and dollar amounts and provide supporting data for each item.)				$2,000			
K. Total Direct Costs (C through I) →				$50,000	0	$0	$0
L. F&A/Indirect Costs. (If applicable, specify rate(s) and base(s) for on/off campus activity. Where both are involved, identify itemized costs in on/off campus bases.)							
M. Total Direct and F&A/Indirect Costs (J plus K) →				$50,000	0	$0	$0
N. Other →							
O. Total Amount of This Request →				$50,000	0	$0	$0

P. Carryover -- (If Applicable) . . . . . **Federal Funds: $** **Non-Federal funds: $** **Total $**

Q. Cost Sharing/Matching (Breakdown of total amounts shown in line O)		
Cash (both Applicant and Third Party) →		
Non-Cash Contributions (both Applicant and Third Party) →		

NAME AND TITLE (Type or print)	**SIGNATURE** (required for revised budget only)	**DATE**
Project Director		
Authorized Organizational Representative		

Signature (for optional use)		

Form CSREES-2004 (12/2000)

BUDGET EXPLANATION FOR THE UNIVERSITY OF WISCONSIN SYSTEM/UNIVERSITY OF WISCONSIN-MILWAUKEE GREAT LAKES WATER INSTITUTE

(Binkowski)

Objectives 1-5

A. Salaries and Wages. A 75% time (per year for two years) Academic Staff position, Aquaculture Regional Extension Facilitator (AREF). To make up a 100% appointment for this AREF position, the remaining 25% salary and fringe benefits will be supported through a combined budget from the University of Wisconsin Great Lakes WATER Institute and the University of Wisconsin Sea Grant Institute. The University of Wisconsin-Milwaukee and the University of Wisconsin-System have been consistent in their support of aquaculture research and outreach activities over the past 17 years in the form of salaries, facilities and materials. Additionally, the University of Wisconsin Sea Grant Institute is funding elements of the current aquaculture outreach program in Wisconsin and is committed to provide funding for these types of activities in the future.

B. Fringe Benefits. The fringe benefit rate at UW-Milwaukee is 32.5% for Academic Staff positions.

E. Materials and Supplies. Annual costs: general office supplies such as paper, pens, folders, toner, etc. ($1,500.00), and computer expenses such as toner cartridges, software, and upgrades ($1,627.00).

F. Travel. Annual costs: Transportation, lodging, and meals in conjunction with attending state association meetings, National Association of State Aquaculture Coordinators meeting, and Sea Grant Great Lakes Network meeting, locations to be determined; and travel within the NCR.

J. All Other Direct Costs. Annual costs: telecommunication ($667), postage ($667), printing and copying publications ($666).

SCHEDULE FOR COMPLETION OF OBJECTIVES

Objective 1. Initiated in Year 1 and completed in Year 2.

Objective 2. Initiated in Year 1 and completed in Year 2.

Objective 3. Initiated in Year 1 and completed in Year 2.

Objective 4. Initiated in Year 1 and completed in Year 2.

Objective 5. Initiated in Year 1 and completed in Year 2.

VITA

Fred P. Binkowski
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EDUCATION

B.S. University of Wisconsin-Milwaukee, 1971, Zoology
M.S. University of Wisconsin-Milwaukee, 1974, Zoology (Fisheries Biology)

POSITIONS

Director (1993-present), Aquaculture Center, University of Wisconsin System, UWS/UWM Great Lakes WATER Institute
Senior Scientist, (1991-present) University of Wisconsin Great Lakes WATER Institute
Associate Scientist (1987-1990), Senior Fisheries Biologist (1984-1986), Associate Fisheries Biologist (1981-1983), Assistant Fisheries Biologist (1978-1980), Center for Great Lakes/University of Wisconsin Great Lakes Research Facility
Research Specialist (Fisheries), (1975-1978) Department of Zoology, U.W.-Milwaukee,

SCIENTIFIC AND PROFESSIONAL ORGANIZATIONS

American Fisheries Society
Early Life History Section, American Fisheries Society
Fish Culture Section, American Fisheries Society
U.S. Aquaculture Society
World Aquaculture Society

SELECTED PUBLICATIONS

Heyer, C.J., T.J. Miller, F.P. Binkowski, E.M. Calderone, and J.A. Rice. 2001. Understanding maternal effects as a recruitment mechanism in Lake Michigan yellow perch (*Perca flavescens*). Canadian Journal of Fisheries and Aquatic Sciences 58:1477-1487.

Yeo, S.E., and F.P. Binkowski. 1999. Beneficial utilization of aquaculture effluents and solids. Report submitted to NCRAC, Michigan State University, East Lansing.

Letcher, B.H., J.A.Rice, L.B. Crowder, and F.P. Binkowski. 1996. Size-dependent effects of continuous and intermittent feeding on starvation time and mass loss in starving yellow perch larvae and juveniles. Transactions of the American Fisheries Society 125:14-26.

Binkowski, F.P., and L.G. Rudstam. 1994. The maximum daily ration of Great Lakes bloater. Transactions of the American Fisheries Society 123:335-343.

Rudstam, L.G., F.P. Binkowski, and M.A. Miller. 1994. A bioenergetics model for analysis of food consumption patterns by bloater in Lake Michigan. Transactions of the American Fisheries Society 123:344-357.

Yeo, S.E., and F.P. Binkowski, editors. 1994. Characterization of aquaculture effluents from four types of production systems. Appendix A: Tabulated database of aquaculture effluent characteristics. Appendix B: Bibliography concerned with aquaculture effluents in various production systems. Report submitted to NCRAC, Michigan State University, East Lansing, Michigan.

Binkowski, F.P., J.J. Sedmack, and S.O. Jolly. 1993. An evaluation of *Pfaffia* yeast as a pigment source for salmonids. Aquaculture Magazine, March/April:1-4.