Economic Development Incentive Grant 2013-14 Annual Report

Institution Name(s): University of Wisconsin – Milwaukee; University of Wisconsin-Whitewater; University of Wisconsin-Parkside	Project Title: Research and Training Center for Commercialization of Intensive Aquaculture and Aquaponics (CCIAA)
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Grant Award Amount: $2.4 million	**Report Date: 7/18/2014**
Grant Funding Spent (to date): $547,688 (Additional $120k encumbered)	**Date project began: 12/2013**
	Date project ends (projected): 6/30/15

I. Status Report

Fundamentals

- The UWM School of Freshwater Sciences (SFS) is engaged in the development of a new indoor aquaculture industry for Milwaukee and Wisconsin. We are working with startup companies in Milwaukee, Racine, and elsewhere to launch a commercially viable intensive aquaculture industry in the Midwest, with urban Milwaukee as its epicenter.

- The UW System Incentive Grant is helping us advance key research initiatives to increase the commercial viability of the industry and to train the workforce this new industry needs.

- The key to this novel type of aquaculture are three significant research achievements, all of which were developed at SFS:
    - SFS developed a North American Yellow Perch broodstock that grows from egg to market size in 10 months instead of 2 years in the wild (this was done through selective breeding and not genetic manipulation);
    - SFS developed and holds the patent for out-of-cycle spawning of North American Yellow Perch, allowing partners to produce multiple crops annually, instead of only once per year;
    - SFS developed the recirculating water systems that house the fish and keep water use to a minimum.

- This type of aquaculture has significant advantages over traditional pond or pen aquaculture systems:
    - It can be done indoors in any location, including the heart of the urban environment;
    - It recycles water, so it is not water-intensive;
    - It does not rely on heavy use of antibiotics to keep fish healthy;
    - It can provide good jobs and a clean source of fish protein in the heart of disadvantaged populations;

- It uses high-value fish, so it is commercially viable, and it can be done domestically in the United States so fish need not be imported from China, Southeast Asia, and South America.

Instructional Update

- On May 27 UWM's new Undergraduate Certificate in Applied Urban Aquaculture was approved. This fifteen credit program will teach students animal husbandry, chemistry, biology, and systems techniques that will allow them to work at and run these innovative fish farms. The skills learned through this program will also be applicable in traditional aquaculture. This program will launch Fall 2014.

- In addition, professional science masters students in SFS will be able to focus their work on aquaculture beginning Fall 2014. This focus will prepare them for management positions in the aquaculture industry.

- Over 100 individuals participated in courses on urban aquaponics held in partnership with Will Allen Farms over summer of 2014. These courses were taught by School of Freshwater Sciences instructors.

- The Incentive grant is providing funds to build two new aquaculture teaching labs for our new academic programs. These are being designed and will be constructed in spring 2015.

- UW-Whitewater's Institute for Water Business, our major partner on the Incentive Grant, is working with us to promote these new programs.

- SFS is also working with the local technical colleges to develop curricula for support staff training and workforce development. SFS has a STEM program with 31 regional high schools providing fish, advice and teacher training for these programs.

Research Update

- The Incentive Grant is also funding new research initiatives in fish nutrition/diet, probiotics to increase fish health in our systems, and new breeding techniques that will produce a faster growing broodstock. These research initiatives will help make the industry more profitable and are underway. Our goal is to develop intellectual property that can be transferred to industry.

Community Update

- We also have major partnerships with not-for-profits including Growing Power and Hunger Task Force to develop sophisticated aquaculture and aquaponics systems for their use. Fish farming at both organizations was developed by researchers at SFS.

Aquaculture Industry Update

- UWM's School of Freshwater Sciences and the UWM Research Foundation are working with three startup companies that will use UWM aquaculture techniques to grow fish in southeastern Wisconsin. One company has acquired a site in Milwaukee for such a purpose. Another is currently completing a deal with a real estate developer for their facility. The third is currently looking for a location for their startup. We anticipate that each of these three startups will make $5 million ($15 million total) in capital investments, employ 20-40 people (60-100 total) within three to five years, and produce 1 million pounds (3 million pounds total) of clean, locally grown fish filets.

- Talks are underway with an investment group interested in launching a fourth startup company for the industry. This company will license technologies from the UWM Research Foundation and will provide fingerlings (baby fish) and consulting services to the other aquaculture companies.

- UW-Whitewater's Institute for Water Business is working with SFS to develop business models for the industry that help in attracting investors. UW-Whitewater and SFS have also submitted a grant to NSF to further develop these models, as well as to model the physical systems that necessary to operate an acquaculture fish grow out facility. These models will provide the blue print or how-to kit, making the launch of a new company easier.

II. Updated Goals/Performance Metrics and Assessment Plans

Please see spreadsheet.

III. Project/Program Budget and Expenditures

Please see budget document.

IV. Changes

No substantial changes to report at this time.

Research and Training Center for the Commercialization of Intensive Aquaculture and Aquaponics

12/1/13-6/30/15

		Budget	12/1/13-6/30/14	7/1/14-6/30/15	Remaining Budget	Notes
1 Training Programs						
	New Staff (Engineer, Technician, Instructors)	305,000	263,877		41,123	
	Intensive Urban Aquaculture Training Laboratory	800,000			800,000	Labs being designed; Construction
	Urban Aquaponics Research and Training Laboratory	375,000			375,000	slated for Spring 2015
Technology and Intellectual Property 2 Advanced Research	Nutrition and Diet Study (Undergrad, Researchers, Post-Doc, Materials)	500,000	201,441		298,559	
	Microbial Ecologies and Probiotics Study (Graduate Researchers, Visiting Faculty, Post Doc, Sequencing, Bench-Scale Set-up, Materials, Pathogen Stressing)	300,000	82,371		217,629	
Marketing and 3 Commercialization						
	Marketing of Training Programs	20,000			20,000	Encumbered but not charged yet
	Commercialization of IP	20,000			20,000	Encumbered but not charged yet
	Market Research and Businedd Plans	20,000			20,000	Encumbered but not charged yet
	Economics and Policy	60,000			60,000	Encumbered but not charged yet
Total Costs		2,400,000	547,688	-	1,852,312	
Total Budget Funded Through UWS Incentive Grants		2,400,000	547,688	-	1,852,312	

UW System Incentive Grant
General Outcomes/Goals Reporting Matrix
2013-14

Incentive Grant Program Name: Research and Training Center for the Commercialization of Intensive Aquaculture and Aquaponics
Funding Allocation: $2.4 million

#	Performance Outcomes Descriptions	Assessment Plan Description	Projected Goals 2013-14	Actual 2013-14 Outcomes	Projected Goals 2014-15
1	Develop a Skilled Aquaculture Workforce	Students Enrolled - Professional Science Master's	NA	NA	7
		Students Enrolled - Undergraduate Certificate	NA	NA	20
		Participants - Intensive Program	NA	NA	25
		Participants - Aquaponics Programs	NA	100 Participants	160
2	Place High Quality Graduates into Industry	Graduate Placement Percentage (Master's and Certificate Programs Only)	NA	NA	80 percent
3	Develop Intellectual Property with Commercial Application	Proprietary and Patentable IP Developed		NA (Patents and IP exist from previous research projects)	2 technologies
4	Attract Ongoing Research Revenue	Grants Attracted - Private Sources (Annual Average)		$75k	$300k
		Grants Attracted - Government Sources (Annual Average)		$590k-$600k	$600k
5	Transfer Technologies into Intensive Aquaculture Industry with Wisconsin at the Center of the Industry	Capital Investment in Aquaculture in Wisconsin and Region (Commitments)		None directly connected to UWM program.	$20 Million
		Total Workforce Employed in Regional Intenstive Aquaculture Industry		20-25	120
		Wisconsin Intensive Aquaculture Industry Sales Revenue (Annual)		NA	$5 Million
		Number of Startup Businesses in Wisconsin		0 (4 Startups in Progress)	2

UW System Incentive Grant Program
Required Program Goals/Outcomes Reporting Matrix
2013-14

Economic Development Goals and Results

Economic development program" means a program or activity having the primary purpose of encouraging the establishment and growth of business in this state, including the creation and retention of jobs, and that satisfies all of the following:

1. The program receives funding from the state or federal government that is allocated through an appropriation under ch. 20
2. The program provides financial assistance, tax benefits, or direct services to specific industries, businesses, local governments, or organizations.

Performance Categories	Goals		Actual Outcomes 2013-14	Accomplished Goal? Yes or No	Notes
	Projected 2013-14	2014-15			
# of Jobs Created	5	40	20-25	Yes	
# of Jobs Retained	NA	NA	NA	NA	Intensive Urban Aquaculture is a Startup Industry
# of Businesses Assisted	2	5	3	Yes	

Additional Goals/Outcomes	Goals		Actual Outcomes 2013-14	Accomplished Goal? Yes or No	Notes
	Projected 2013-14	2014-15			
Capital Investment in Aquaculture Industry	NA	$20 million	NA	NA	It is anticipated that five new business will launch by 2019
Aquaculture Sales - Wisconsin Industry	NA	$5 million	NA	NA	
New Startup Businesses	NA	2	NA	NA	It is anticipated that five new businesses will launch by 2019

UW System Incentive Grant Program
Required Program Goals/Outcomes Reporting Matrix
2013-14

Development of a Skilled and Educated Workforce

Programs that have as their objective the development of an educated and skilled workforce, such as the following:

a. Increasing the number of bachelor's, master's, and doctoral degrees awarded in fields for which occupational demand is high or in fields that the board and the department of workforce development jointly determine to be high-demand fields.

b. Increasing the number of opportunities available to students to gain work experience in their fields through internships or cooperative work experiences.

c. Increasing or enhancing research and development.

	Goals		Actual Outcomes 2013-14	Accomplished Goal? Yes or No	Notes
	Projected 2013-14	2014-15			
# of Bachelor's degrees awarded in high-demand fields	0	0	0	NA	We will enroll 20 students in the undergraduate certificate program by 2015
# of Master's degrees awarded in high-demand fields	0	0	0	NA	We will enroll 7 students in the master's program by 2015
# of Doctoral degrees awarded in high-demand fields	NA	NA	NA	NA	
Enrollment in Intensive Aquaculture Program	NA	25	NA	NA	Program Launch in Fall 2014
Participants in Aquaponics Programs	NA	160	100	Yes	In partnership with Growing Power
# of internships created (paid)	NA	NA	NA	NA	
# of internships created (unpaid)	NA	NA	NA	NA	
# of cooperative work experiences (paid)	NA	NA	NA	NA	
# of cooperative work experiences (unpaid)	NA	NA	NA	NA	

Increasing or Enhancing Research and Development Reporting

Goals	Anticipated Completion Dates	Actual Completion Dates	Accomplished Goal? Yes or No	Notes
Proprietary and Patentable Intellectual Property Developed	2015	NA	NA	2 new areas by 2015; 3 by 2017; 4 by 2019
Research Publications	2016	NA	NA	2 Publications by 2016; 3 by 2018; 4 by 2020
Research Grants Attracted - Private Sources (Annual Average)	2015	95k	NA	$300k by 2015; $400k by 2017; 700k by 2019
Research Grants Attracted - Government Sources (Annual Average)	2015	$600k	Yes	$600k by 2015; $700k by 2017; 900k by 2019

UW System Incentive Grant Program
Required Program Goals/Outcomes Reporting Matrix
2013-14

Improve the Affordability of Higher Education

Programs that Improve the Affordability of Higher Education for Resident Undergraduates, including:

a. Reducing the time required to obtain a degree
b. Increasing the opportunities available for high school pupils to earn credit toward a postsecondary degree; and
c. Improving the transfer of credit between institutions of higher education.

Reducing the Time required to obtain a Degree

Goals	Anticipated Completion Dates	Actual Completion Dates	Accomplished Goal? Yes or No	Notes

Increasing the Opportunities available for High School Pupils to earn Credit toward a Postsecondary Degree

Goals	Anticipated Completion Dates	Actual Completion Dates	Accomplished Goal? Yes or No	Notes

Improving the transfer of Credit between Institutions of Higher Education

Goals	Anticipated Completion Dates	Actual Completion Dates	Accomplished Goal? Yes or No	Notes
			NA	