

Economic Development Incentive Grant 2013-15 Final Report

Institution Name(s): UW-Stevens Point & UW-Extension	Project Title: Aquaculture Business Incubator and Aquaponic Innovation Center: Economic Development for Emerging Agricultural Industries
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Grant Funding Spent (to date): \$551,583.24	Date project began: July 1, 2013
	Date project ends (projected): June 30, 2016 No-cost extension requested December 2015

I. Status Report

Aquaculture -

Over the past two years, thirteen continuing education and technical training courses in aquaculture and aquaponics were developed and offered to current and prospective aquaculturists, university students and life-long learners. These included both introductory and advanced courses in aquaponics, controlled environment agriculture, business planning, permitting & regulations, marketing, pond culture & water quality, fish health and diseases, feeding & nutrition, cool & cold water fish in RAS and principles of biofiltration.

UW-Extension personnel analyzed current laws, policies and regulations as they pertain to aquaculture. This included holding regulation and rules listening sessions with the industry to better understand the current regulatory environment and those issues most urgent for an expanding aquaculture industry. Personnel were also intimately involved with the Wisconsin Walleye Initiative and its grant program and spearheaded discussions on the culture of lake sturgeon by private industry. Recently, UW-Extension personnel collaborated with WI Senators to introduce LRB 3518: Regulation of aquaculture and fish farms. This proposed legislation will receive committee review in early February 2016. In summary, the proposed legislation would make Wi a friendlier state for continued aquaculture industry development.

Aquaponics –

In April 2015, the UWSP Aquaponics Innovation Center opened and hosted 700 attendees where numerous discussions were held on needed resources for the fledgling industry. This included discussions of business innovations and needed pathways to promote aquaponics. More than 30 new aquaponics businesses were present with each represented by former students that completed at least one of the three continuing education aquaponic courses offered by UWSP.

UW-Stevens Point now offers three online and hybrid online/in-person college courses in the field of aquaponics including principles of aquaponics, introduction to aquaponics and controlled environment agriculture. In 2011, twenty-four students completed the nation's first semester long, college aquaponics course offered at UWSP. In 2015, seventy-four students completed the aquaponics courses offered by UWSP. This is a three-fold increase in participation and included high school, university and life-long learners.

In September 2014, UW-Stevens Point became the first accredited university in the nation to offer a professional aquaponics certificate program. It is composed of courses in plant, fish, and microbiology along with business, pathology, water chemistry and entomology courses. Nine college students have enrolled in the

certificate program and in May 2015 the first student graduated with a professional aquaponics certificate. She is currently developing her own private aquaponics business in East-Central, Wis.

Also in May 2015, the first two student interns began working at the UWSP-Aquaponics Innovation Center. They conducted industry-requested innovative research raising walleye and cold adapted plants (broccoli, kale, pak choi and romaine lettuce) in the AIC systems. Already the research has garnered media coverage from Wisconsin Public Radio, Seedstock Magazine and Aquaculture North America Newspaper. Based on this research, the project PI was also recognized with a UW-System Regent Scholar grant.

The UWSP Northern Aquaculture Demonstration Facility and Aquaponics Innovation Center has been fortunate in receiving a variety of grants to sustainably continue the programs initiated with the EDI Grant. They include:

- Sea Grant College Program –
 - Workforce Education and Training for Environmentally & Economically Sustainable Great Lakes Aquaculture for \$291,751.
 - Production and economic evaluations of new technologies for raising yellow perch fingerlings for \$216,030.
 - Sea Grant outreach specialist for \$120,000.
 - Optimizing walleye stocking density and nutrient recycling in traditional and integrated aquaculture systems for \$214,724.
- UW-System/Board of Regents – Regent Scholar grant, Aquaponics innovation through undergraduate education and discovery for \$50,000.
- Li-Cor LEEF grant – Educational use of Li-Cor LI-6400XT portable photosynthesis system in aquaponics for \$25,000.
- USDA-Small Business Innovative Research for Spawning, fry production and hybridization technologies for producing walleye for food-fish and stocking for \$149,735.
- SBIRAdvance grant from the Center for Technology Commercialization - Commercializing spawning, fry production and hybridization technologies for producing walleye for food-fish and stocking for \$13,000.
- USGS – Effects of aquaculture drugs on nitrogen oxidation of biofilters of recirculating aquaculture systems for freshwater finfish for \$16,423.
- Great Lakes Fish Commission – Maintenance of F2 lake trout for research on genetic diversity for \$21,000.
- USDA/NIFA - Aquaculture Boot Camp (ABC) Phase 2: Enhancing the sustainability of beginning aquaculture/aquaponic and next generation farmers in the Midwest by providing innovative training and high-value toolkits for \$34,733 (*submitted*).

II. Goals/Performance Metrics and Assessment Plans

Aquaculture Business Incubator –

- 1. Develop continuing education courses**
- 2. Modify laws, rules & regulations**

As discussed in previous status reports, UW-Stevens Point expanded its continuing education course offerings by offering two semester-long aquaponics courses: Principles of Aquaponics and Introduction to Aquaponics; partnered with a WI-based private aquaponics business, Nelson & Pade, Inc. to offer college credit and continuing education units for 3-day Master Classes in controlled environment agriculture and about starting aquaponic businesses; updated its Aquaculture minor to cover topics in fish disease, aquaponics, and aquatic microbiology; established the first-of-its-kind professional aquaponics certificate for academic consistency in the field of aquaponics.

UW-Extension offered and assisted with modifying laws, rules and regulations through:

- Two Regulation and Rules Listening Sessions held with Wisconsin aquaculture industry, 34 attendees; two week open comment period.
 - Report of Rules and Regulations Sessions sent to DATCP & DNR
- Wisconsin Walleye Initiative Regulatory Review & Recommendations Study sent to Wisconsin State Legislature November 15, 2013. The report listed 14 recent changes in place, six changes in progress, and seven proposed future changes concerning aquaculture rules and regulations <http://dnr.wi.gov/topic/fishing/documents/outreach/WWIRuleReport.pdf>.
- Conducting and reporting on The Private Fish Farm Capacity Study in conjunction with DNR, DATCP, DOA, WEDEC and WAA member fish farms as directed in the Wisconsin Walleye Initiative. June 30, 2014.
- Wisconsin Walleye Initiative Grant Program- Participated in the program development and awarding of Aquaculture Expansion grants to Hayward Bait and Bottle Shop, Coolwater Farms LLC, Gollon Bait and Fish Farm, Northside Enterprises, Central Wisconsin Fish Farm LLC, Taal Lake Hatchery, Lac du Flambeau Band of Lake Superior Chippewa Indians, Sokagon Chippewa Community and St. Croix Chippewa Indians of Wisconsin.
- Lake Sturgeon Options for Private Aquaculture in Wisconsin co-authored by Ron Johnson, Jim Held (UW-Extension), and Ron Bruch, (WI-Department of Natural Resources). Recommended changing three Wisconsin statutes so private fish farmers can legally possess and raise lake sturgeon <http://www.wisconsinaquaculture.com/Docs/597.PDF>.
- Met on two occasions with Silver Moon Springs Trout Farm Elton, Wisconsin with DNR staff and Senator Tiffany regarding permits and compliance issues; DNR has until September 1, 2014 to issue needed permits.
- Met with Ron & Dave Williams farm in Waukesha County with DNR staff to explore possible dam permit compliance issues.

For each project goal we exceeded our expectations. Over the two years of the EDI project we helped create 65 jobs, helped retain over 120 jobs and assisted over 95 aquaculture businesses. We completed over 410 promotions or assistances with technology transfer and helped place 19 university students in aquaculture/aquaponic internships.

Data collected in the first year of the project identified a need for more student interns placed directly at aquaculture and aquaponics businesses. Therefore, in 2015, we were able to partner with four aqua-businesses that helped co-sponsor student interns directly at their businesses. Four of those interns were offered permanent jobs at the private companies upon completion of their internship.

Aquaponic Innovation Center –

- 1. Investigate new business innovations**
- 2. Develop pathways to promote aquaponics**

The majority of efforts in year-2 have been directed at constructing the infrastructure required to promote new business innovations and develop pathways to promote aquaponics. This has included:

- Construction of the UWSP-Aquaponic Innovation Center (<http://www.uwsp.edu/aquaponics>). UW-Stevens Point continued its collaborative partnership with Nelson & Pade, Inc, Montello, WI, a national leader in science-based, commercial aquaponics, by leasing space at their business campus where the UWSP-Aquaponic Innovation Center was constructed. This provided the facility and businesses unprecedented access to the latest industry innovations and further strengthens our combined efforts to provide workforce training and new business development. The UWSP-AIC held its Grand Opening in April 2015 where over 700 people attended and the facility received national attention as the first-of-its-kind in the U.S. The facility has already partnered with various university scientists and businesses to begin investigating new innovations and to help promote aquaponics. This includes:
 - University of Wisconsin-Madison Department of Horticulture
 - Li-Cor Biosciences
 - Hach Company
 - Yellow Spring Instrument
 - University of Minnesota Veterinary Medicine
 - University of Wisconsin Veterinary School
 - Bayfield County Economic Development Corporation
 - Blue Planet Fish
 - Sea Grant College Program
- The Professional Aquaponic Certificate program became available at UW-Stevens Point in September 2014. The establishment of an industry certificate program was identified as an immediate need by aquaponic industry representatives. UW-Stevens Point is the first university in the U.S. to offer an academic-based aquaponic certificate program that can be completed by individuals at universities across the U.S. Seven students have enrolled in the certificate program and our first student completed the program in May 2015.
- UW-Stevens Point expanded its academic course offerings in aquaponics including a semester-long online course titled: Principles of Aquaponics and a hybrid (online/in-person) course titled: Introduction to Aquaponics. Students that enrolled in the courses were enrolled at UWSP and universities across WI, the U.S. and internationally.
 - 2012: 27 students enrolled with 9 non-UWSP students; 81 credit hours generated.
 - 2013: 51 students enrolled with 20 non-UWSP students; 123 credit hours generated.
 - 2014: 55 students enrolled with 29 non-UWSP students; 126 credit hours generated.
 - 2015: 74 students enrolled with 13 non-UWSP students; 175 credit hours generated.
- Three-day Aquaponic Master Classes were offered by the UW-Stevens Point/Nelson & Pade, Inc. partnership. During the 2014-15 reporting period, 174 attendees completed the classes and 30 of those purchased, constructed, or launched new aquaponic businesses.
- In 2013, the UW-Stevens Point Foundation assisted with and is the operational home to the International Aquaponics Society (IAS). The IAS held its inaugural conference in summer 2013 with over 150 attendees from around the world. The IAS is planning its second international conference for June 2016. In November 2015, UWSP will host the International Recirculating Aquaculture workshop a renowned program that attracts attendees worldwide.

Direct business assistance was provided as part of continuing efforts to develop pathways and promote commercial business in Wisconsin. This included:

- Meeting with Russ Davis and Kerri and Todd Weberg of Sayner, Wisconsin on several occasions to help them with site and business planning to open new trout farm operation
- Assisting Morning Sun Farms of Milltown, Wisconsin with micro-green business to establish aquaponics system
- Assisting HMR Organics, Osceola, Wisconsin on business planning for aquaponics system
- Helping the following WI farms remain in business by providing technical and or regulatory assistance: Gollon Bait and Fish Farm, Silver Moon Springs, LLC, Hayward Bait and Tackle, Star Prairie Trout Farm, Northside Enterprise, Central Wisconsin Fish Farm, and Ron Larson Bait and Walleye, Clean Fresh Food, Rushing Waters Fisheries Inc., Coolwater Farms LLC, Taal Lake Hatchery, Dairyland Shrimp, Natural Green Farms.

Broader public assistance was provided on specific topics to attract new aquaculture/aquaponic businesses and included:

Workshops/Meetings -

- Genetics and Water Code Workshop Mishicot, WI - 25 attendees
- 19th Annual Wisconsin Aquaculture Conference Mishicot, WI - 125 attendees
- 20th Annual Wisconsin Aquaculture Conference Marshfield, WI - 140 attendees
- Aquaponics Conference Prairie Community College, Brookings SD - 275 attendees
- Three Wisconsin Aquaculture Industry Advisory Council (WAIAC) meetings – 75 attendees
- Multicultural Awareness & Customer Service Workshop Summerset, WI - 30 attendees
- University of Minnesota Veterinary College Student Fishery Workshop Star Prairie, WI - 20 attendees
- ANSTF meetings in Washington DC as liaison to aquaculture industry
- Wisconsin Walleye Initiative Grant Program Award Meeting Madison, WI - 10 attendees
- Ohio-Michigan Aquaculture Conference / NCRAC Annual Workgroup Toledo, OH - 270 attendees
- NCRAC Annual Workgroup, Ames, IA 65 attendees
- Rural Landowners Conference Kenosha, WI 85 attendees
- SAE Grant Awards Meeting Madison, WI 14 attendees
- Numerous on-site visits with recreational pond owners, prospective fish farmers, and other interested parties to provide technical and advisory assistance.
- Wisconsin Aquaculture Industry Advisory Board Meetings – Star Prairie & Marshfield
- Wisconsin Aquaculture Association Board Meetings – Star Prairie & Marshfield
- Mobile Fish Processing Unit Conference Calls
- Aquaculture Industry Conference Call on EPA proposed changes to Clean Water Act
- Federal Aquatic Nuisance Species Task Force Meetings – Washington DC & Ft Lauderdale, FL
- DNR and Industry Rules/Regulation Meeting, Black River Falls, WI

Community and Educational Outreach -

- Boy Scout Jamboree Somerset Wisconsin 250 attendees
- Booth at Osceola Wellness Fair, Osceola, Wisconsin
- Booth at Farm Technology Days, Stevens Point, WI – 322 attendees at booth
- Northern Great Lakes Visitor Center Kids Fishing Day Ashland, WI - 450 attendees

- Meetings with Wildlife Forever, Inc Brooklyn Center, MN to engage the aquaculture industry with national Stop Aquatic Hitchhikers Campaign
- Hudson YMCA Summer Youth Kids Star Prairie, WI - 90 attendees
- 4-H Youth Agriculture Experience Madison, WI 15 attendees
- Aquaponics course final exam Montello, WI 50 attendees
- Aquaculture presentations and assistance at the following schools: Cornell HS, Auburn HS, Ashland HS, Winneconne HS, Milton HS, Waukesha North HS, Milwaukee Vincent HS, Stoughton HS, Albany HS, and UW-Madison Meat and Animal Science.

Assessment:

Quantitative Data:

Percent aquaculture & aquaponic businesses that remained in business	95.7%
Percent new aquaculture and aquaponic businesses	4.48%
Value of production increase	\$462,000
Percent increase in sales	23.7%
Number of jobs retained and created	185

Performance Goal Metrics:

Participants in courses & workshops	2,692
Credit hours from education	>500
State rules, laws & regulations modified	1 (one under review)
Participants using AIC	62
Innovations tested at AIC	2 (currently working on 4 more)

Implementation of Assessments:

The Aquaculture Business Incubator and Aquaponic Innovation Center: Economic Development for Emerging Agricultural Industries project’s effectiveness can be rated as very high. Over 2,600 individuals were provided services during the project’s completion. During the project, Wisconsin’s aquaculture industry increased sales by 23.7% worth \$462,000. While sales and production increased, Wisconsin continued its pattern of losing and creating about the same number of aquaculture and aquaponic businesses. It is believed this as a result of some unnecessary state rules, laws and regulations and legislation to modify those issues was recently submitted to the Wisconsin State Legislature (LRB 3518: Regulation of aquaculture and fish farms). The UW-Stevens Point Northern Aquaculture Demonstration Facility and Aquaponics Innovation Center have become vital resources for the Wisconsin aquaculture and aquaponics industries, respectively. The two programs operate as sister facilities and this greatly increases the efficiency of the two resources while simultaneously serving a larger business sector. Over the two years of the project, the industry valued what the program provided and it came to be the “go to” program for assisting the industry’s needs and expectations. One of the greatest achievements of the project was the rapid development of the program in meeting the needs for successful economic development and innovation for Wisconsin aquaculture and aquaponics. The tougher task lies ahead as we

attempt to continue the services and resources the industries have come to expect while we search for continued funding for the programs.

III. Project/Program Budget and Expenditures

Source of Funds: Incentive grant funding

Total proposed budget:

Category	Description	Rate	FY2014	FY2015
Personnel - Salary				
Limited term employee	Aquaponic educator	12 mo		\$45,000
Personnel – Fringe benefits	“Actual fringe”	40%		\$18,000
Non-personnel				
Supplies, Expenses & Travel			\$32,687	\$40,000
Indirect costs	On-campus	34.5%	\$11,277	\$35,535
Other				
Subgrant to UW-Extension				\$135,000
Capital expenditures			\$360,000	
Annual totals			\$403,964	\$273,536
Grand total				\$677,500

Cumulative year-to-date spending:

Category	Description	Rate	FY2014	FY2015-16	Carryover ¹
Personnel - Salary					
Subaward	Greenhouse manager		\$21,000	\$13,125	\$44,625
Non-personnel					
Supplies, Expenses & Travel			\$0	\$77,651.78	\$10,398.54
Indirect costs	On-campus		\$0	\$12,119.89	\$3,587.49
Other					
Subgrant to UW-Extension			\$0	\$134,992.30	
Capital expenditures & lease			\$181,000	\$124,000	\$55,000
Subtotal			\$202,000	\$361,888.97	\$113,611.03
Grand total			\$563,888.97		

1. A no-cost extension was requested in early December 2015 to extend the budget period. The remaining balances in Capital expenditure & lease and Personnel-greenhouse manager are committed and fully encumbered based on a 5-year MOU with Nelson & Pade, Inc. Remaining Supplies, expenses & travel and Indirect costs will be spent by 6/30/16.

IV. Changes

As part of a mutually beneficial arrangement, the UWSP Aquaponics Innovation Center (AIC) was constructed at our private business partner Nelson & Pade Inc. in Montello, Wis. This not only provided a location for the AIC, but allowed for conjoined development of the most modern aquaponics education, applied research and manufacturing facility in the nation. UWSP has a five year lease for the greenhouse facility and a half-time greenhouse manager paid for four years.