

**Environment and Natural Resources Trust Fund  
2020 Request for Proposals (RFP)**

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**Project Title:**

**ENRTF ID: 132-C**

LSC Living Lab: Operations and Dissemination

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**Category:** C. Environmental Education

**Sub-Category:**

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**Total Project Budget: \$** 258,058

**Proposed Project Time Period for the Funding Requested:** June 30, 2022 (2 yrs)

**Summary:**

We propose to develop, demonstrate and disseminate several new farming methods that have the potential to improve human health and stimulate local economic development while reducing environmental impacts.

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**Name:** Randel Hanson

**Sponsoring Organization:** Lake Superior College (LSC)

**Job Title:** Dr.

**Department:** Letters of Arts and Sciences

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**Location:**

**Region:** Northeast

**County Name:** St. Louis

**City / Township:** Duluth

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**Alternate Text for Visual:**

Map of the LSC Campus Living Lab Field Site including the major features to be included in the new 2 acre living lab field site

_____ Funding Priorities	_____ Multiple Benefits	_____ Outcomes	_____ Knowledge Base
_____ Extent of Impact	_____ Innovation	_____ Scientific/Tech Basis	_____ Urgency
_____ Capacity	_____ Readiness	_____ Leverage	_____ TOTAL _____%

## PROJECT TITLE: LSC Living Lab: Operations and Dissemination

### I. PROJECT STATEMENT

We seek support for the LSC Living Lab, a new 2-acre outdoor classroom for teaching, research and demonstration devoted to sparking entrepreneurship around sustainable agriculture, renewable energy, and value-added processing. This living classroom will showcase economic methods and benefits generated by increased local food production, processing, marketing and distribution and co-located renewable energy systems. It will serve as the core for a new two-year Associate of Science Degree Program in Eco-Entrepreneurship at Lake Superior College (LSC), which integrates science, applied science, entrepreneurship and social analysis in advancing sustainable food and energy systems (to be launched fall of 2019). Our launch of the Eco-Entrepreneurship Program responds to increased citizen/consumer interest in local/healthy foods and the tremendous economic development potential offered by local food production. We propose to develop, demonstrate and disseminate promising small-scale sustainable and regenerative farming methods (bio-intensive, open field sustainable and organic, permaculture, hydroponic, etc.) that have the potential to improve human health and stimulate regional economic development while reducing the environmental impacts of agriculture. These methods have been shown to increase farm revenues (via increased multi-enterprising production, season extension and new market penetration) while reducing land and water use by approximately 90%; energy and nutrient use by 50%; and eliminating chemical inputs, soil erosion and nutrient runoff. We will develop a working farm (8,000 ft<sup>2</sup> of greenhouse space and 2 acres of land) at Lake Superior College (LSC) to monitor, improve upon and demonstrate the economic and environmental performance of the most promising new sustainable-organic farming methods. This teaching and demonstration farm will include production, processing, marketing and distribution activities. We will then disseminate these methods and their environmental/economic performance data to MN farmers, community groups and future farmers (K-12 schools and LSC students) via a web site, social media, printed materials (flyers and posters) speaking engagements, local media, site tours, field days, open houses, workshops and training programs. The project will primarily serve NE Minnesota, where smaller scale agriculture is particularly fitting, growing, and in need of institutional support, but project results will be applicable and useful throughout MN.

### II. PROJECT ACTIVITIES AND OUTCOMES

#### Activity 1 Title: Develop and Demonstrate Sustainable Farming Methods

**Description:** Establish a 2-acre 'living laboratory' outdoor classroom on the LSC campus that demonstrates diverse sustainable agriculture methods (two 30' x 80' high tunnels, bio-intensive, open field raised bed, organic, permaculture, hydroponic, etc.) along with their associated processing, marketing and distribution systems. We will monitor and continuously work to improve their environmental and economic performance. The objective is to develop, demonstrate and educate students and the public about diverse small-scale sustainable agriculture methods that can be readily duplicated throughout MN to increase access to locally harvested foods and generate local economic development. The outcomes of this educational initiative are to generate entrepreneurial-based economic development, improve human and environmental health, and contribute to enhanced social inclusion and well-being associated with increased local food production. This activity will also provide all content necessary for Activity #2. The diverse sustainable agriculture, processing, marketing and distribution methods will be evaluated based on their environmental and economic performance.

**ENRTF BUDGET: \$127,386**

Outcome	Completion Date
1. Establish working farm to develop and demonstrate sustainable agricultural methods	September 2020
2. Collect environmental and economic performance data for each production system	June 2022
3. Analyze performance data and compare results of various production systems	June 2022

**Activity 2 Title: Project Result Dissemination and Training**

**Description:** The sustainable model farming methods along with their environmental and economic performance will be disseminated to a wide variety of audiences (k-12 students, LSC students, community leaders, farmers and farming organizations) via a web site, social media, printed materials (flyers and posters) speaking engagements, local media, site tours, field days and open houses. In addition, a specific set of training programs will be developed and offered through LSC to anyone interested in mastering these new production, processing and marketing techniques. Graduates of these trainings will be in a position to incorporate these methods into their new or existing farming operations. The object of this activity is to communicate our project results with as many people as possible, and to generate widespread duplication of our production methods. The impact of these outcomes will be evaluated by measuring visitation to our web and social media sites, surveying the effectiveness of our presentations and materials, numbers visiting our field site and enrollment in our workshops and trainings. Ultimately our project effectiveness will be evaluated by the number of individuals or groups that actually duplicate these methods, along with tracking the resulting increase in local food production/consumption, the decline in negative environmental impacts associated with regional farming and the increase in local economic development.

**ENRTF BUDGET: \$130,672**

<b>Outcome</b>	<b>Completion Date</b>
<i>1. Develop all Dissemination Materials (social media, website, posters, fliers, etc...)</i>	<i>May 2021</i>
<i>2. Develop and conduct site tours, open houses and annual field day celebrations</i>	<i>June 2022</i>
<i>3. Develop/Conduct trainings to feature production, processing and marketing methods</i>	<i>June 2022</i>

**III. PROJECT PARTNERS AND COLLABORATORS:**

Dr. Michael Mageau and Dr. Randel Hanson have recently been hired by LSC to develop and Direct the new Eco-Entrepreneurship Program and associated Living Lab Field Site. Together they will co-manage the project. Dr. Mageau directed the interdisciplinary Environment and Sustainability (ES) degree program and has been working on the development of sustainable food and energy systems for the past 20 years at the University of MN, Duluth (UMD). Dr. Hanson established and directed UMD's Land Lab for the past 10 years and co-directed the ES Program. LSC will hire an experienced farm manager in May of '19 to assist Dr. Mageau and Dr. Hanson with the management of the new degree program, sustainable farming operations and educational/dissemination activities at LSC. We will also be working with Tamara Arnott, LSC Dean of Workforce Development, and her administrative assistant to develop and administer the workshops/trainings. Finally, we will have the assistance of numerous LSC faculty, staff and students to conduct this project. Outside of LSC, we will be working with our regional Sustainable Farming Association (SFA) and the American Indian Community Housing Organization (AICHO) to develop the specific trainings and identify regional farmers to help with training instruction. We will also work with the several Duluth area grocery stores and restaurants that purchase our produce, as well as Anna Wirta-Kosobuski, UMD Medical School, who is working with the Nett Lake Reservation in NE MN to improve the health of its population, and will be purchasing our produce to aid in this effort.

**IV. LONG-TERM IMPLEMENTATION AND FUNDING:**

Given the LCCMR support required to launch this proposed project, activities and results will be implemented indefinitely. We will continue to develop and demonstrate the most promising production, processing and marketing techniques, gather the environmental and economic performance data, disseminate project results and conduct the educational activities, workshops and trainings. These ongoing efforts will be funded by a combination of LSC, produce sales, revenues from workshops/trainings and future grants.

**V. SEE ADDITIONAL PROPOSAL COMPONENTS: Attached Separately (A, B, F, H)**

Attachment A: Project Budget Spreadsheet  
 Environment and Natural Resources Trust Fund  
 M.L. 2020 Budget Spreadsheet

Legal Citation:

Project Manager: Dr. Randel Hanson

Project Title: LSC Living Lab: Operations and Dissemination

Organization: Lake Superior College (LSC)

Project Budget: \$258,058

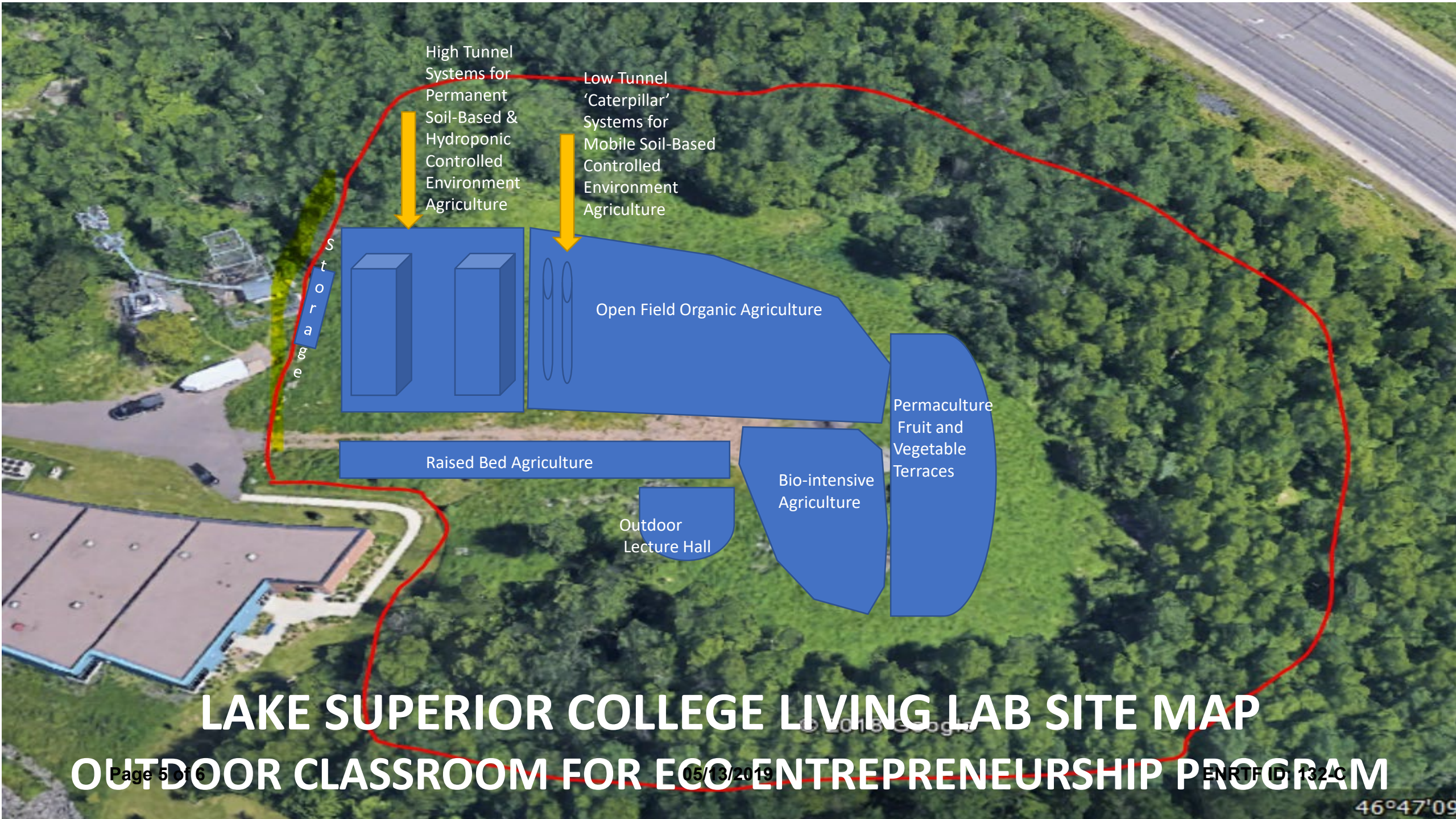
Project Length and Completion Date: 2 years; 6/30/22

Today's Date: 4/11/19



ENVIRONMENT AND NATURAL RESOURCES TRUST FUND BUDGET		Budget	Amount Spent	Balance
BUDGET ITEM				
Personnel (Wages and Benefits)				
Dr. Mageau, Co-project manager (72% Salary; 28% Benefits) 30% FTE; 2 years		\$ 79,028	\$ -	\$ 79,028
Dr. Hanson, Co-project manager (72% Salary; 28% Benefits) 30% FTE; 2 years		\$ 79,028	\$ -	\$ 79,028
Farm Manager, to be hired May of '19 (72% Salary; 28% Benefits) 10% FTE; 2 years		\$ 13,344	\$ -	\$ 13,344
LSC Admin Assistant, project administration (72% Salary; 28% Benefits) 10% FTE; 2 years		\$ 13,344	\$ -	\$ 13,344
LSC Students, project labor (93% Salary; 7% Benefits) 40% FTE; 2 years		\$ 19,008	\$ -	\$ 19,008
Professional/Technical/Service Contracts				
Training Instructors, training development/instruction by RFP (100% Contractual Salary) 20% FTE; 2 years		\$ 26,400	\$ -	\$ 26,400
Equipment/Tools/Supplies				
Storage Shed (8' x 20' shipping container) delivered		\$ 2,500		\$ 2,500
Biothrive organic concentrated nutrient solution (4, 6 gallon jugs @ 203.95 each)		\$ 816		\$ 816
LED Grow Lights (4 solar extreme 1000w @ \$899 each)		\$ 3,596		\$ 3,596
4' x 8' 1.5" Rigid Foam Insulation (20 sheets @ \$22 each)		\$ 440		\$ 440
BCS Walking Tractor Implement -- 36" Power Harrow		\$ 2,749		\$ 2,749
BCS Walking Tractor Implement -- 36" Mulch Layer		\$ 990		\$ 990
Jang 3-row professional seeder		\$ 945		\$ 945
Outdoor Classroom Amplitheatre (for community events and student education)		\$ 2,900		\$ 2,900
1 Low tunnel greenhouse package (6' x 100')		\$ 1,410		\$ 1,410
1 High Tunnel greenhouse package (20' x 40')		\$ 2,560		\$ 2,560
Capital Expenditures Over \$5,000				
Fee Title Acquisition				
		\$ -	\$ -	\$ -
Easement Acquisition				
		\$ -	\$ -	\$ -
Professional Services for Acquisition				
		\$ -	\$ -	\$ -
Printing				\$ -
promotional materials (fliers, posters, brochures, mailings etc...)		\$ 3,000	\$ -	\$ 3,000
Travel expenses in Minnesota				
Regional Farm Visits (10 visits @ \$200/visit) covers mileage and meals		\$ 2,000		\$ 2,000
Conference Presentations (4 @ \$1,000 each) covers reg, mileage, meals, lodging		\$ 4,000		\$ 4,000
		\$ -	\$ -	\$ -
Other				
		\$ -	\$ -	\$ -
COLUMN TOTAL		\$ 258,058	\$ -	\$ 258,058
SOURCE AND USE OF OTHER FUNDS CONTRIBUTED TO THE PROJECT	Status (secured or pending)	Budget	Spent	Balance
Non-State: Lloyd K. Johnson Foundation for Farm Equipment and Supplies	Secured	\$ 25,000	\$ -	\$ 25,000
Produce Sales (estimated to be approximately \$50,000/year) to help cover field site operational and labor costs	Secured	\$ 100,000	\$ -	\$ 100,000
State: Lake Superior College (LSC): Expenses budgeted by LSC for Eco-	Secured	\$ 260,000	\$ -	\$ 260,000
In kind:		\$ -	\$ -	\$ -
Other ENRTF APPROPRIATIONS AWARDED IN THE LAST SIX YEARS	Amount legally obligated but not yet spent	Budget	Spent	Balance
Victus Farms: Expanding in New Directions (7/1/14-6/30/16)		\$ 176,000	\$ 176,000	\$





High Tunnel  
Systems for  
Permanent  
Soil-Based &  
Hydroponic  
Controlled  
Environment  
Agriculture

Low Tunnel  
'Caterpillar'  
Systems for  
Mobile Soil-Based  
Controlled  
Environment  
Agriculture

Storage

Open Field Organic Agriculture

Raised Bed Agriculture

Bio-intensive  
Agriculture

Permaculture  
Fruit and  
Vegetable  
Terraces

Outdoor  
Lecture Hall

# LAKE SUPERIOR COLLEGE LIVING LAB SITE MAP

## OUTDOOR CLASSROOM FOR ECO-ENTREPRENEURSHIP PROGRAM



## **F. Project Manager Qualifications and Organizational Description**

This project will be co-managed by Dr. Michael Mageau and Dr. Randel Hanson. Dr. Mageau received his M.S. in Environmental Biology from the University of MN, Duluth (UMD) and his Ph.D. from the University of Maryland in Environmental Science with a certificate in Ecological Economics and Sustainable Development. Over the past 20 years Before his recent move to Lake Superior College (LSC), Dr. Mageau spent the past 20 years directing the former Environment and Sustainability (ES) Degree Program and the Center for Sustainable Community Development (CSCD) at The University of Minnesota, Duluth (UMD). There, he raised and administered over 2 million in grants to support the development of community scale, sustainable food and energy systems. He launched several wind monitoring and community wind development projects along the Northshore of Lake Superior and worked with many NE MN communities on various renewable energy feasibility studies (ie., wind, solar, biomass, bio-diesel etc...). He also established and directed several large-scale greenhouse production facilities in Northeastern MN (ie., UMD's Victus Farms in Silver Bay, MN and the UMD Land Lab's Greenhouse Production System in Duluth, MN), and worked to effectively disseminate project results, help others duplicate these production methods and educate high school and college students. Dr. Mageau will oversee the Controlled Environmental Agriculture (CEA) methods, renewable energy system demonstrations, project reporting and administrative activities. Dr. Hanson received his Ph.D. in American Environmental Studies from the University of Minnesota and has been a college professor for over two decades. For the past decade he founded and directed the UMD Land Lab at the at the University of Minnesota, Duluth. Prior to joining UMD, he held faculty positions at Rice University and Arizona State University. Hanson has also been deeply involved in food systems work at the community, regional and state levels. He coordinated the Superior Grown Food Summit and was the Chair of the Food Systems Committee in the Duluth Green Jobs Planning Process. He co-founded Growing Farms, the Good Food Network, and co-directed UMD's ES Program and the CSCD. Dr. Hanson will oversee the soil-based methods and coordinate community partner involvement. Mageau and Hanson will work together on the development and delivery of all dissemination materials and trainings. We will also have the added qualifications of LSC's experienced new Farm Manager, to be hired in May of '19 to assist Dr. Mageau and Dr. Hanson with the management of the new degree program, sustainable farming operations and educational/dissemination activities at LSC. Finally, we have an experienced LSC Administrative Assistant who will help with required LCCMR communications and reporting as well as dissemination activities, promotional material development, marketing, advertising and training administration efforts.

Lake Superior College (LSC) is an open-enrollment, two-year, public, post-secondary institution offering more than 100 majors, programs for transfer, continuing education, and customized training. LSC annually prepares 9,000 credit students for an associate's degree, transfer to a four-year institution, immediate entrance to the job market, upgraded career skills, training opportunities, or enhanced life-long learning skills. LSC was created when the Duluth Technical College and Duluth Community College Center merged in 1995. With a community focus, lower tuition costs, and workforce development flexibility, community colleges are increasingly becoming institutional engines for sustainable community development. LSC was recently ranked the best community college in Minnesota as well as among the top 20 community colleges in the nation by Niche. As it adds affordable dormitories over the next two years and adopts a residential-based 'living laboratory' approach to education, LSC will embrace a greater role in addressing the sustainable development needs of Duluth and the western Lake Superior region. Finally, the new Eco-Entrepreneurship Program at LSC is focused on building skillsets for small business development with emphasis on sustainability, equity, and social inclusion. This exciting new educational content will enhance LSC's ability to carry out it's community service mission.