

**Environment and Natural Resources Trust Fund  
2014 Request for Proposals (RFP)**

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**Project Title:**

**ENRTF ID: 079-C**

Integrating Environmental Education in Grade 3-12 Economics Curriculum

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**Category:** C. Environmental Education

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**Total Project Budget:** \$ 96,816

**Proposed Project Time Period for the Funding Requested:** 3 Years, July 2014 - June 2017

**Summary:**

The project will enhance the abilities of up to 10,000 students in grades 3-12 to analyze trade-offs between environmental protection and economic development and make choices to achieve sustainable balances.

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**Sponsoring Organization:** Minnesota Council on Economic Education

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**Location**

**Region:** Statewide

**County Name:** Statewide

**City / Township:**

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<input type="checkbox"/> Funding Priorities	<input type="checkbox"/> Multiple Benefits	<input type="checkbox"/> Outcomes	<input type="checkbox"/> Knowledge Base
<input type="checkbox"/> Extent of Impact	<input type="checkbox"/> Innovation	<input type="checkbox"/> Scientific/Tech Basis	<input type="checkbox"/> Urgency
<input type="checkbox"/> Capacity Readiness	<input type="checkbox"/> Leverage	<input type="checkbox"/> Employment	<input type="checkbox"/> TOTAL <input type="checkbox"/> %



**I. PROJECT STATEMENT**

This project will enhance the abilities of up to 10,000 Minnesota students in grades 3-12 to analyze trade-offs between environmental protection and economic development and make choices to achieve sustainable balances for both present and future generations. Student outcomes will be assessed with pre- and post-tests to determine gains in achievement, with average gains of 40% anticipated. Over three years, 128 Minnesota teachers will be trained to implement environmental education curricula, lead hands-on activities and simulations, and assess student achievement. These teachers will be trained by PhD university faculty members. To facilitate classroom implementation of the curricula, eight experienced K-12 educators will serve as co-teachers. The co-teachers themselves will receive intensive training in the curricula before co-teaching with the PhD faculty. Teacher learning will also be assessed with pre- and post-tests, with average gains of 25% anticipated. In Years 2 and 3, student contests will be held to reinforce learning. The time is opportune to initiate this project, as new state academic standards adopted in 2013 mandate instruction in economics concepts at each grade level K-8 and a semester-long course in high school. Integrating environmental education in economics curriculum will feed the interest and passion of students for protecting the environment as they work to meet the new standards.

**II. DESCRIPTION OF PROJECT ACTIVITIES**

**Activity 1: Train eight exceptional teachers to serve as co-teachers with PhD faculty members in the subsequent environmental economics education workshops for 128 teachers of grades 3-12** **Budget: \$ 18,023**

MCEE will identify eight exceptional classroom teachers (four elementary and four secondary) to co-teach environmental economics education workshops with PhD faculty. These eight co-teachers will participate in a three-day workshop (one at each grade band) led by faculty trainers. Participating teachers will receive curricula, \$250 participation incentives, and limited travel reimbursement, and lunch and refreshments (which retains focus on the workshop and helps to guarantee a full workshop day). Curricula supported by this project include *Economics and the Environment* (secondary), *Economics and the Environment: Eco-Detectives* (secondary) and *Seas, Trees and Economies* (grades 3-6). The curricula are published by the Council on Economic Education or affiliated university centers. They have been successfully implemented throughout the country with proven effectiveness (e.g., 42% average increase in student achievement from pre- to post-test with *Seas, Trees, and Economies*). Elementary curriculum includes these key concepts: scarcity, opportunity costs, trade-offs, value, price, and incentives. Secondary concepts include: public goods, externalities, tragedy of the commons, voluntarism, direct controls, and taxation.

Outcome	Completion Date
1. Eight exceptional classroom teachers will be equipped to co-teach (with PhD faculty trainer) the aforementioned environmental economics curricula to 128 teachers of grades 3-12.	Summer, 2014

**Activity 2: Train 128 teachers of grades 3-12 to implement the aforementioned environmental economics curricula and assess student achievement** **Budget: \$ 55,415**

Eight one-day professional development workshops (4 elementary, 4 secondary) for 16 teachers each will be held throughout the state during 2014-16. The workshops will train teachers to implement the project curricula described above, to run the simulations and other hands-on activities in the curricula, and to assess student achievement. Teachers will receive \$100 participation incentives, mileage reimbursement, curricula, lunch and refreshments. (MCEE chooses to provide modest \$100 teacher incentives for holding the workshops on Saturdays, rather than the more expensive option of holding workshops on school days and paying for substitute teachers). The workshops will be held in St. Paul, Mankato, St. Cloud, and Duluth, in conjunction with MCEE's affiliated centers for economic education at universities in those cities, which will provide in-kind support in room rental and making workshop arrangements.



Outcome	Completion Date
1. 128 classroom teachers will be prepared to implement the aforementioned environmental economics curricula and student assessment.	Fall, 2016
2. Participating teachers will achieve average gains of at least 25% from pre- to post-test	Fall, 2016

**Activity 3: Implement lessons and assess student achievement**

**Budget: \$ 23,378**

Teachers will implement lessons with up to 10,000 students (assumes 125 students per secondary teacher; 32 per elementary teacher) with guidance/support from an implementation coach who will provide on-going mentoring through online communications, allowing teachers to seek help and exchange information. Coaches will also be available for one-on-one consultations and will track implementation and student assessment. Forty teachers will be selected to assess student outcomes using pre- and post-tests. Incentives of \$175 will be provided to these forty teachers upon completion of classroom implementation and student assessment. Student contests will be offered to facilitate active learning and deepen understanding of concepts. Essay competitions will be held at the secondary level, judged by a panel of university faculty. For elementary students, grade-appropriate projects such as drawings, posters, and short essays will be designed and implemented. Modest monetary prizes (\$100, \$50, and \$25 for 1<sup>st</sup> – 3<sup>rd</sup> place winners) and \$100 for teachers of winning students will be utilized to encourage entry and promote quality in the contests.

Outcome	Completion Date
1. Up to 10,000 students will gain understanding of environmental economics concepts	Spring, 2017
2. Student outcomes will be assessed by 40 teachers	Spring, 2017
3. Students will experience average gains of at least 40% from pre- to post-test.	Spring, 2017

**III. PROJECT STRATEGY**

**A. Project Team/Partners**

The project director is Professor Donald Liu, Executive Director, Minnesota Council on Economic Education, and *Morse-Alumni Distinguished Professor*, Department of Applied Economics, University of Minnesota, Twin Cities. He will assure project quality by providing overall project supervision and on-going evaluation (XX hours). Implementing the project will be Jane Stockman, Associate Director (XX hours); Meghan Timmel, Program Associate (XXX hours); and Rachel Blazinski, Program Assistant (XX hours). Their tasks will include recruitment of teachers, logistical arrangements for workshops, recruitment, guidance, oversight, and evaluation of project contractors, preparing payment of workshop expenses, analyzing and reporting data from teachers and workshop and project evaluation, and any other tasks necessary for a successful project. Faculty from the University of Minnesota and/or other Minnesota universities will be contracted to serve as Ph.D.-level trainers. Partners include University of Minnesota (Twin Cities and Duluth), State Cloud State University, and Minnesota State University-Mankato, which will provide in-kind support through hosting training workshops. Minnesota Council on Economic Education will receive all funding from this grant.

**B. Timeline Requirements**

2014-15: Train eight experienced teachers to co-teach professional development workshops; train at least 64 classroom teachers of grades 3-12; begin classroom implementation of the curricula and student assessment.  
 2015-16: Train remaining cohorts of classroom teachers of grades 3-12; continue classroom implementation of the curricula and student assessment; hold first set of student contests  
 2016-17: Conclude implementation and student assessment; second set of student contests; evaluate project outcomes.

**C. Long-Term Strategy and Future Funding Needs**

The proposed project will continue to contribute to improving the environmental decision-making knowledge of Minnesota students as the teachers continue to implement the lessons year after year. The project model will be used as a prototype for training additional teachers in the future with the goal of further expanding program reach to Minnesota youth. While future funding could be used for professional development for more teachers, additional funding is not required to complete the proposed project as described in this application.

## 2014 Detailed Project Budget

Project Title: *INTEGRATING ENVIRONMENTAL EDUCATION IN GRADE 3-12 ECONOMICS CURRICULUM*

### IV. TOTAL ENRTF REQUEST BUDGET - 3 years

<u>BUDGET ITEM</u>	<u>AMOUNT</u>
<b>Personnel:</b>	
Project Director: 1.3% FTE; 75% salary, 25% benefits; 1 position; active Years 1-3	7,480
Associate Director: 2.7% FTE; 74% salary, 26% benefits; 1 position; active Years 1-3	7,181
Program Associate: 3.4% FTE; 75% salary, 25% benefits; 1 position; active Years 1-3	6,880
Program Assistant: 3.7% FTE; 71% salary, 29% benefits; 1 position; active Years 1-3	4,872
<b>Contracts:</b>	
Workshop instructors	14,900
Assessment preparation	4,000
Implementation coaches	3,000
Design brochure	400
Judge student contests	800
<b>Equipment/Tools/Supplies:</b>	
Workshop supplies	3,590
Curricula	2,737
<b>Acquisition</b>	\$ -
<b>Travel:</b>	0
Teacher travel reimbursement	4,590
Instructor travel reimbursement	2,750
<b>Additional Budget Items:</b>	
Teacher incentives for workshops	14,800
Teacher incentives for assessing students	7,000
Print & mail brochures	5,800
Student & teacher contest awards	1,900
Workshop lunch & refreshments	4,136
<b>TOTAL ENVIRONMENT AND NATURAL RESOURCES TRUST FUND \$ REQUEST =</b>	<b>\$ 96,816</b>

### V. OTHER FUNDS

<u>SOURCE OF FUNDS</u>	<u>AMOUNT</u>	<u>Status</u>
<b>Other Non-State \$ Being Applied to Project During Project Period:</b>	\$ -	
<b>Other State \$ Being Applied to Project During Project Period:</b>	\$ -	
<b>In-kind Services During Project Period:</b>	\$ 7,000	<i>Secured</i>
Room rental for workshops (14 days @ \$500)		
<b>Remaining \$ from Current ENRTF Appropriation (if applicable):</b>	\$ -	
<b>Funding History: None</b>	\$ -	

**Integrating Environmental Education in Grade 3-12 Economics Curriculum  
MINNESOTA COUNCIL ON ECONOMIC EDUCATION**

**Anticipated  
Outcomes**

**Students**

- Up to **10,000 students** in grades 3-12 have **increased understanding** of and skills in the decision-making needed to achieve a **sustainable balance** between **environmental protection and economic development**.
- Students achieve an **average gain in understanding of 40%** from pre- to post-test

**Teachers**

- **128 teachers** of grades 3-12 are prepared with knowledge and skills to implement environmental economics curricula.
- Teachers achieve an **average gain in understanding of 25%** from pre- to post-test.
- **8 exceptional K-12 teachers** are prepared to **co-teach with PhD trainers** in environmental economics to K-12 teachers.

**ACTIVITIES**

**Year 1**

- **Two 3-day trainings** prepare eight selected teachers to co-teach with PhD trainers in environmental economics to K-12 teachers.
- **Four one-day trainings** prepare 64 teachers to implement curricula and assess student achievement.
- **Implementation of curricula**, using simulations and other hands-on activities.

**Year 2**

- **Four one-day trainings** prepare an additional 64 teachers to implement curricula and assess student achievement.
- **Implementation of curricula**, using simulations and other hands-on activities.
- **Student assessment**
- **First round of student contests**

**Year 3**

- **Implementation of curricula**, using simulations and other hands-on activities.
- **Student assessment**
- **Second round of grade-appropriate student contests** to engage students in a deeper understanding of concepts.
- **Project evaluation and report.**

## INTEGRATING ENVIRONMENTAL EDUCATION IN GRADE 3-12 ECONOMICS CURRICULUM

### PROJECT MANAGER QUALIFICATIONS & ORGANIZATIONAL DESCRIPTION

#### Project Manager

Donald J. Liu, Ph.D., is Executive Director of the Minnesota Council on Economic Education (MCEE) and Morse-Alumni Distinguished Teaching Professor, Department of Applied Economics, University of Minnesota, Twin Cities, where he has taught since 1995. Honors and recognition for teaching and research Dr. Liu has received include:

- *National Award for Excellence in College and University Teaching in the Food and Agricultural Sciences* (Regional Recipient): USDA, CSREES, 2007.
- *Distinguished Undergraduate Teaching Award for More Than Ten Years' Experience*: American Agricultural Economics Association, 2006.
- *Horace T. Morse Distinguished Teacher*: University of Minnesota Alumni Association Award for Outstanding Contributions to Undergraduate Education, 2006.
- National Institute for Commodity Promotion Research and Evaluation: Advisory and Steering Committees
- *Agribusiness*: An International Journal: Editorial Board
- USDA Higher Education Challenge Grant Review Panel

To view Dr. Liu's full vita and other credentials, please visit his web page at [faculty.apec.umn.edu/dliu/](http://faculty.apec.umn.edu/dliu/).

#### Sponsoring Organization

The sponsoring organization of this project is the Minnesota Council on Economic Education (MCEE), a 501(c)(3) organization hosted by the Department of Applied Economics, University of Minnesota, Twin Cities. Incorporated in 1961, MCEE's mission is to provide Minnesotans with the economic and financial knowledge they need to function effectively in a complex, global environment. MCEE is an affiliate of the national Council on Economic Education (CEE), a nationwide partnership of state councils and centers for economic education and research.

MCEE's primary strategy to address its mission is through professional development of K-12 teachers. Research has shown that teachers equipped with deeper content deliver a more productive learning experience for their students. In 2011-12, MCEE provided professional development in a variety of curricula for 613 Minnesota teachers. They, in turn, reached over 60,000 students in their first year post-training. They will go on to affect more students as they continue to implement curricula year after year.

MCEE is experienced in providing successful professional development for teachers of grades 3-12 in environmental economics curricula. Each summer for the past 10 years, MCEE has offered a 3-day workshop on *Energy and the Environment* for 25 secondary teachers, including preparation in the secondary curricula supported by the currently proposed project. Additionally, with funding from the EPA, MCEE successfully implemented train-the-trainer workshops in a number of states to promote nationwide dissemination and implementation of *Seas, Trees & Economies*, the environmental economics curriculum for grades 3-6 supported by the currently proposed project. This project took place in 2006-07.