



# Environment and Natural Resources Trust Fund

2024 Request for Proposal

## General Information

**Proposal ID:** 2024-023

**Proposal Title:** Supporting Minnesota Teachers Implement Culturally Sustaining Environmental Education

## Project Manager Information

**Name:** Seth Thompson

**Organization:** U of MN - College of Biological Sciences

**Office Telephone:** (605) 431-7747

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## Project Basic Information

**Project Summary:** To support teachers in addressing new science standards , we propose a series of workshops across Minnesota facilitating conversation about sustainability and water conservation, specifically integrating western science and Indigenous perspectives.

**Funds Requested:** \$311,000

**Proposed Project Completion:** June 30, 2026

**LCCMR Funding Category:** Environmental Education (C)

## Project Location

**What is the best scale for describing where your work will take place?**

Statewide

**What is the best scale to describe the area impacted by your work?**

Statewide

**When will the work impact occur?**

During the Project and In the Future

## Narrative

### **Describe the opportunity or problem your proposal seeks to address. Include any relevant background information.**

Water is a fundamental resource for supporting life and a central part of Minnesotan culture. Protecting Minnesota's water requires commitment from Minnesotans to take action and an examination of the fundamental relationship between humans and our environment. Indigenous communities across Minnesota have a long history of engagement with environmental conservation and sustainability, yet much of the science and education that informs Minnesota's approach to water conservation omits Indigenous knowledge and perspectives. Additionally, the recent revamping of the Minnesota State Science Standards included a number of new benchmarks related to teaching conservation perspectives of MN Tribes & communities. While this represents a significant step forward in ensuring that traditional knowledge and Indigenous ways of knowing are reflected in the teaching of Science for Minnesota youth, few teachers have been prepared to instruct their students on these topics. In particular, most teachers across MN have no formal training on Indigenous science philosophy, history, or methods, which makes instruction on the convergence of Indigenous science and Western science a challenge. To create an environmentally literate society that is equipped to protect Minnesota's waters, we must create and implement culturally supportive educational resources that help learners make informed choices that support sustainable natural resource management.

### **What is your proposed solution to the problem or opportunity discussed above? Introduce us to the work you are seeking funding to do. You will be asked to expand on this proposed solution in Activities & Milestones.**

Here we propose to unite multidisciplinary scientists with teachers and students to promote environmental literacy and intercultural understanding. Through culturally integrated environmental education, we will engage students in practices that emphasize sustaining tribal heritage alongside scientific advancement. To better support teachers in effectively meeting new standards and to create resources for science learning that highlights Indigenous Science knowledge, we propose to host a series of summer teacher professional development workshops for middle/high school science teachers across Minnesota. Teachers will consider the environmental impacts of human behaviors from multiple perspectives and grapple with the complexities of our relationship to natural ecosystems. We will further support these teachers during the school year with a culturally responsive curriculum and opportunities for field-based learning experiences to ensure that students have access to a culturally integrated science experience. By providing teacher support and integrated classroom education focused on protecting Minnesota's water, we aim to help cultivate a community that cares about the natural world and has the tools to protect it. This work will enhance the scientific literacy and environmental ethos of our communities, and build meaningful relationships with marginalized communities across Minnesota to engage in impactful environmental conservation.

### **What are the specific project outcomes as they relate to the public purpose of protection, conservation, preservation, and enhancement of the state's natural resources?**

Achieving a future of sustainability for water resources requires committed community actions. Realizing this collective action depends on communities dedicated to environmental stewardship and possess a strong environmental ethos. This proposal will facilitate this through teacher workshops that highlight Indigenous perspectives on environmental sustainability in communities throughout the state. In total, we expect this project to directly engage ~80 middle/high school teachers resulting in curriculum delivery to 12,000 Minnesota youth over the two year project. This reach will have a cascading effect of building public environmental literacy as well as supporting ongoing dialogue on environmental sustainability across Minnesota.

## Activities and Milestones

### Activity 1: Design and Deliver Teacher Workshops

**Activity Budget:** \$211,000

**Activity Description:**

We will host a series of annual 1-day workshops that use a combination of hands-on outdoor education with community-centered dialogue. We aim to develop and lead workshops covering four topics that are of critical importance to Minnesota's water resources: invasive species, climate change, urbanization and agriculture/industrial impacts. To align with the new Minnesota Science Standards, we will incorporate the three-dimensional learning framework that emphasizes science practices, disciplinary core ideas, and crosscutting concepts while also blending Indigenous funds of knowledge. By explicitly integrating these aims and perspectives, we will provide science educators with a more holistic knowledge base of both Indigenous science and practical applications of the new science standards. We propose to host four workshops per year (two workshops in the Twin Cities, one in Bemidji, and one in Duluth). We will recruit 10 teachers for each workshop in year one. In year two, each teacher will return and we will recruit 10 additional teachers per workshop (for 20 teachers total per workshop), creating mixed experience cohorts that will enhance collaborative learning. In total, we expect to work with 80 unique Minnesota teachers over the two years resulting in curricula delivering to at least 12,000 students.

**Activity Milestones:**

Description	Approximate Completion Date
Co-develop material for workshops with community leaders	December 31, 2024
Recruit 40 teacher participants for 1st workshop offering	June 30, 2025
Host 1st iteration of PD workshops	July 31, 2025
Recruit 2nd cohort of 40 teachers	May 31, 2026
Host 2nd interaction of PD workshops	June 30, 2026

### Activity 2: Delivery of Culturally Integrated Curriculum

**Activity Budget:** \$100,000

**Activity Description:**

Effective professional development (PD) for educators relies on approaches that support self-efficacy while also building meaningful relationships across participants. That method, called the professional learning community (PLC) model, has long been a standard used in education to support educator growth while also developing a cohort that learns from and supports one another. In relation to PD concepts that may be challenging, such as culturally responsive pedagogies, science educators need a scaffolded approach that both builds their understanding during initial training, and then follows-up with support throughout and after implementation. To support science teachers in this capacity, we will offer two pre-classroom implementation meetings with PLC groups to address concerns about the activities they will integrate into their instruction. Teachers will have an opportunity in those meetings to brainstorm and troubleshoot ideas with each other, as well as the PD leaders. Following implementation, teachers will also engage in two post-implementation meetings where they will debrief whether and how the activities were successful, thus aiding the revision process for future PDs. Undergraduate researchers will be available throughout the year to assist in data collection and analysis and help identify areas where teachers may need additional support.

**Activity Milestones:**

Description	Approximate Completion Date
Assemble PLC Groups for teachers	July 31, 2025

Complete pre-implementation meetings	December 31, 2025
Complete post implementation meetings	May 31, 2026

## Project Partners and Collaborators

Name	Organization	Role	Receiving Funds
Hillary Barron	Bemidji State University	Co-PI; Barron will be responsible for facilitating partnerships with tribal colleges and community partners. She will also provide expertise in cultural responsiveness and educational best practices for the project.	Yes
James Cotner	University of Minnesota - College of Biological Sciences	Cotner is a Professor in the Department of Ecology, Evolution, and Behavior and will provide expertise in aquatic biogeochemistry and field ecology. He will advise on workshop development and implementation.	Yes
Katie Johnston-Goodstar	University of Minnesota - College of Education and Human Development	Johnston-Goodstar is an Associate Professor in the Department of Social Work and will provide expertise in indigenous youth development and advise on development and implementation of the teacher workshops.	Yes

## Long-Term Implementation and Funding

**Describe how the results will be implemented and how any ongoing effort will be funded. If not already addressed as part of the project, how will findings, results, and products developed be implemented after project completion? If additional work is needed, how will this work be funded?**

With this support, we will develop a scalable model of teacher professional development and curricular programming. We will pursue financial sustainability through state and federal grants and engage with the University of Minnesota Foundation to secure funding with local foundation partners. The data collected on sustainability pedagogies will also lead to additional research questions and we anticipate building upon the research in this proposal with future applications to the NSF Discovery PreK-12 program. Teacher toolkits and classroom curriculum will be made freely available online to increase dissemination and impact.

## Project Manager and Organization Qualifications

**Project Manager Name:** Seth Thompson

**Job Title:** Director of Outreach

**Provide description of the project manager's qualifications to manage the proposed project.**

Seth K. Thompson is the Director of Outreach for the College of Biological Sciences at the University of Minnesota and Co-Director of the College's Impact Exchange. He brings over a decade of experience in implementing public engagement and outreach programs to our team. Currently, he oversees the College's outreach programs, including the InSciEd Out Program Twin Cities hub, Market Science, and the SciSpark Scholars mentorship program. He has worked with the InSciEd Out program for over 5 years, developing programming from the ground up that now serve over 3,000 students annually in the Twin Cities with a focus on communities underrepresented in science. He has extensive experience working with K-12 teachers, having provided professional development programming for over 75 teacher partners and maintains strong connections with K-12 teachers and administrators across the Twin Cities. Under his leadership, the Market Science program hosted over 60 community events last year resulting in over 9,000 interactions with Minnesotans. Additionally, he has expertise in STEM education research and multiple publications relating to inquiry-based science education and STEM equity. He has mentored over 20 undergraduate researchers and several graduate students. His role in the proposed project is to oversee all programming by working with potential district partners, recruiting new teacher partners, supervising student staff (both graduate and undergraduate) and managing the budget and administrative tasks of the proposed project. Details on his current projects and a list of publications can be found on his website (<http://thom2587.wixsite.com/sciencewithimpact>).

**Organization:** U of MN - College of Biological Sciences

**Organization Description:**

The University of Minnesota is the second largest public research university in the United States, hosting faculty with expertise across the sciences as well as education and facility design. The College of Biological Sciences (CBS) is one of seven freshman-admitting colleges at the University of Minnesota. CBS focuses its undergraduate and graduate attention toward research, primarily in the biology fields of biochemistry, genetics, ecology, and plant biology. It is one of only two colleges in the country dedicated to the biological sciences and its students' academic ranking is the second highest of any college at the University. With expertise in both ecology and biology teaching and learning, CBS is uniquely positioned to contribute expertise to this project.

## Budget Summary

Category / Name	Subcategory or Type	Description	Purpose	Gen. Ineligible	% Benefits	# FTE	Classified Staff?	\$ Amount
<b>Personnel</b>								
Academic Faculty		James Cotner, PhD, Co-PI: 8% paid effort (1 calendar month) per year for all project periods. Cotner will be responsible for managing the scientific merit of the program and the alignment of outreach programming to most recent research in limnology and water conversation. Cotner will provide scientific mentorship and supervision for the summer graduate student			27%	0.08		\$14,000
Graduate Student (summer)		Graduate Student (summer), TBD: 50% summer support for all project periods. The graduate student will collaborate with the Co-PIs to offer the summer workshop series and support the overall management of the proposed programming. calculation includes tuition			45%	1		\$107,000
Academic Faculty		Katie Johnston-Goodstar, PhD, Co-PI: 8% paid effort (1 calendar month) per year for all project periods. Johnston-Goodstar will provide expertise in indigenous youth development and advise on development and implementation of the teacher workshops.			27%	0.08		\$14,000
Undergrad		Undergraduate research assistants are paid at a rate of 16.50 per hour and will support data collection and project implementation efforts.			0%	2		\$30,000
							<b>Sub Total</b>	<b>\$165,000</b>
<b>Contracts and Services</b>								
Bemidji State University	Sub award	Dr. Hillary Barron at Bemidji State will serve as the project Co-lead and provide exercise in teacher professional development and Indigenous pedagogy. Subaward will support 1 month of summer salary for Barron per year as well as support for undergraduate research assistants and mileage reimbursement for travel to workshops.				24		\$74,000
							<b>Sub Total</b>	<b>\$74,000</b>

<b>Equipment, Tools, and Supplies</b>								
	Tools and Supplies	Consumable supplies (such as water quality testing reagents, plastic lab ware, sample bottles, etc) and classroom curriculum kits for teachers participating in the summer workshop. We budget for \$150 in supplies per participating teacher for a total of \$18,000 over the 2 year project.	Operational/Event Supplies					\$18,000
							<b>Sub Total</b>	<b>\$18,000</b>
<b>Capital Expenditures</b>								
							<b>Sub Total</b>	-
<b>Acquisitions and Stewardship</b>								
							<b>Sub Total</b>	-
<b>Travel In Minnesota</b>								
							<b>Sub Total</b>	-
<b>Travel Outside Minnesota</b>								
							<b>Sub Total</b>	-
<b>Printing and Publication</b>								
							<b>Sub Total</b>	-
<b>Other Expenses</b>								
		Participant Support	We request funds to pay a stipend for a community member to join the event facilitation team for each of the 12 events. These community representatives will be vital for sharing the perspectives of the local community and engaging in a reciprocal					\$54,000



			partnership. We also request \$350 stipends per participating teacher for their participation in our research activities associated with the project.					
							<b>Sub Total</b>	<b>\$54,000</b>
							<b>Grand Total</b>	<b>\$311,000</b>

Classified Staff or Generally Ineligible Expenses

Category/Name	Subcategory or Type	Description	Justification Ineligible Expense or Classified Staff Request
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## Non ENRTF Funds

Category	Specific Source	Use	Status	Amount
<b>State</b>				
In-Kind	Indirect costs associated with this proposal at 55% MTDC.	Indirect costs cover both facilities costs and administrative costs that are incurred by the University of Minnesota when conducting sponsored research, instruction, and public service projects.	Potential	\$108,877
In-Kind	Cost share and indirect for PI	PI will not be paid directly from funds for this grant, but will committing effort to make sure objectives of grant will be performed.	Secured	\$2,561
			<b>State Sub Total</b>	<b>\$111,438</b>
<b>Non-State</b>				
			<b>Non State Sub Total</b>	-
			<b>Funds Total</b>	<b>\$111,438</b>

## Attachments

### Required Attachments

#### *Visual Component*

File: [f12d1124-b7f.pdf](#)

#### *Alternate Text for Visual Component*

Figures representing the logic model guiding the proposed work as well as a conceptual diagram of the structure of summer workshops....

### Optional Attachments

#### *Support Letter, Photos, Media, Other*

Title	File
Authorization to Submit from SPA	<a href="#">b8e1f034-e9e.pdf</a>

## Administrative Use

**Does your project include restoration or acquisition of land rights?**

No

**Does your project have potential for royalties, copyrights, patents, or sale of products and assets?**

No

**Do you understand and acknowledge IP and revenue-return and sharing requirements in 116P.10?**

N/A

**Do you wish to request reinvestment of any revenues into your project instead of returning revenue to the ENRTF?**

N/A

**Does your project include original, hypothesis-driven research?**

Yes

**Does the organization have a fiscal agent for this project?**

Yes, Sponsored Projects Administration

**Does your project include the design, construction, or renovation of a building, trail, campground, or other capital asset costing \$10,000 or more?**

No

**Do you propose using an appropriation from the Environment and Natural Resources Trust Fund to conduct a project that provides children's services, as defined in Minnesota Statutes section 299C.61 Subd.7?**

Yes

**Do you certify that background checks are performed for background check crimes, as defined in Minnesota Statutes, section 299C.61, Subd. 2, on all employees, contractors, and volunteers who have or may have access to a child to whom children's services are provided by your organization?**

Yes