



Environment and Natural Resources Trust Fund

2024 Request for Proposal

General Information

Proposal ID: 2024-177

Proposal Title: Rural MN Mobile Lab: Environmental/Earth Science Education

Project Manager Information

Name: Timothy Dudley

Organization: U of MN - Crookston

Office Telephone: (218) 281-8261

Email: timothy.j.dudley@gmail.com

Project Basic Information

Project Summary: The CREST team wants to create a mobile lab with innovative, engaging educational activities that would be used to travel to underserved, underrepresented schools and community events in Northwest Minnesota

Funds Requested: \$459,000

Proposed Project Completion: June 30, 2027

LCCMR Funding Category: Environmental Education (C)

Project Location

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

Region(s): NW

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.

Currently with the shift in state science standards to include more environmental and earth science content, Northwest Minnesota schools are in need of classroom supplements as well as professional development in these areas. Most professional development opportunities are hosted closer towards the Minneapolis area which can be a burden for many educators. This shift in science standards has also exposed an already inequitable educational experience for underserved/underrepresented schools within NW Minnesota communities. Many school districts are struggling with budget and personnel adjustments. With a mobile lab, schools/groups our team would travel to the school campus for educational opportunities that could not be afforded otherwise. Being able to provide this service would alleviate most of the travel, material and personnel expenses for the district that are often a hurdle when attempting to provide outside of the classroom educational experiences.

We plan to engage students and parents in summer educational opportunities in the Northwest Minnesota rural communities as well. By providing summer educational camps, attending county fairs, public library events, etc., we hope citizens will use this as an opportunity to get outside into Minnesota's environment and apply what they are learning in a real-world setting.

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.

In order to best serve the education needs in Northwest Minnesota, one of the needs we would like to address is equipment that students and educators can use to better understand environmental and earth science concepts. These items can be expensive and not feasible for each school district or home-school group to purchase. CREST plans to offer groups the opportunity to experience activities that more affluent communities have access to. This could be done either by bringing a mobile lab to their location or visiting the University of Minnesota Crookston (UMC) campus. We are requesting funds to purchase the equipment and infrastructure (e.g., trailer for mobile lab) needed to make this possible.

Another need that we plan to address is the lack of resources and logistics of school districts offering out-of-classroom educational experiences. Schools are having a hard time finding support personnel (e.g., substitute teachers, bus drivers) to provide opportunities for students to engage in educational activities outside of the classroom. With the mobile lab traveling to the school, it eliminates that barrier. We are requesting funds for the CREST team to travel to these locations.

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?

Providing hands-on, engaging educational opportunities will create a lasting impact on students' educational journey as life-long learners as well as allow educators to become more empowered in their teachings. Enhancing environmental and earth science education will undoubtedly lead to citizens being better informed about the impact of their actions on our natural resources. Our hope is that students will decide to pursue a career working in environmental sciences or natural resources because of the experiences we have provided or supported.

Activities and Milestones

Activity 1: Academic School Year Educational Activities in Rural Northwest Minnesota Utilizing the Mobile Lab and CREST Sponsored Events

Activity Budget: \$195,000

Activity Description:

Each academic school year, CREST will utilize the mobile lab to offer educational experiences for schools in Northwest Minnesota by traveling to school locations, public events, STEM competitions and serve as a tool for professional development. The mobile lab will provide environmental and earth science experiences for students and educators that do not have the resources to provide hands-on learning opportunities or access to travel for out of the classroom experiences. We will also offer educational experiences for groups who are willing and able to come to the University of Minnesota Crookston (UMC) to utilize the mobile lab as well as campus facilities.

CREST's mobile lab will be a visiting educator on school campuses, provide public events at libraries and STEM competitions, host educational, youth groups at the University of Minnesota Crookston campus, and offer professional development opportunities for educators. Each year of the grant period we will conduct a mid-year and end of year assessment to gather feedback about the impacts of provided educational experiences.

Activity Milestones:

Description	Approximate Completion Date
Host/Participate in 15 educational experiences impacting 500 students and educators in 2024-2025 School Year.	May 31, 2025
Host/Participate in 18 educational experiences impacting 600 students and educators in 2025-2026 School Year.	May 31, 2026
Host/Participate in 20 educational experiences impacting 750 students and educators in 2026-2027 School Year.	May 31, 2027
Semi-annual assessments of impact on academic school year educational experiences	May 31, 2027

Activity 2: County Fair and Summer Camp Educational Experiences in Rural Northwest Minnesota

Activity Budget: \$264,000

Activity Description:

Each summer, the goal will be to provide educational experiences for students and the general public in as many communities as possible. Most of these experiences will focus on environmental science and natural resource content that involve hands-on activities as many of these events are expected to be outdoors. One of the primary activities is attending county fairs in NW Minnesota and having STEM-based activities for citizens to engage in. The mobile lab will allow us to offer a wide range of activities for citizens at the county fairs. While attending the county fairs, we use the opportunity to connect with educators and other educational, youth groups to offer our services during the academic school year and inform them of events we have planned during the summer and/or school year.

We plan to administer a survey to citizens that participate in CREST activities at county fairs and educational camps to gain insight on what activities were beneficial and how we could provide a more impactful experience in the future.

Activity Milestones:

Description	Approximate Completion Date
Participate in 10 county fairs and educational camps in NW Minnesota in summer 2024	August 31, 2024

Participate in 12 county fairs and educational camps in NW Minnesota in summer 2025	August 31, 2025
Participate in 15 county fairs and educational camps in NW Minnesota in summer 2026	August 31, 2026
Summative assessment of impact on CREST summer activities	January 31, 2027

Project Partners and Collaborators

Name	Organization	Role	Receiving Funds
Prof. Anthony Schroeder	University of Minnesota Crookston	Co-Principle Investigator	Yes
Amber Murry	University of Minnesota Crookston	Co-Investigator	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?

This is an ongoing, long-term project that has received broad support at the local, regional, and state levels based on need. We have secured initial funding from the University of Minnesota and private entities. We are actively looking for long-term funding from state and federal agencies and hope LCCMR can provide funds to continue and expand this program in the short term.

Other ENRTF Appropriations Awarded in the Last Six Years

Name	Appropriation	Amount Awarded
Freshwater Sponges And AIS: Engaging Citizen Scientists	M.L. 2021, First Special Session, Chp. 6, Art. 5, Sec. 2, Subd. 03k	\$400,000

Project Manager and Organization Qualifications

Project Manager Name: Timothy Dudley

Job Title: Associate Professor - University of Minnesota Crookston

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

Since my initial appointment as a faculty member in chemistry at the University of Minnesota Crookston (UMC) in 2012, I have actively engaged the public in scientific inquiry through numerous activities. These activities include lab exploration days at UMC, visits to public school science classrooms, summer robotics camps, sponsoring the Western MN Regional Science Fair, and engaging the public at county fairs in northwest Minnesota. Last year, my colleague Prof. Tony Schroeder and I started the Center for Rural Education in Science and Technology (CREST) at the Crookston campus at the University of Minnesota to centralize efforts to engage students and the general public in STEM. Our mission is to help disadvantaged rural communities get the resources and experiences they need to get students confident and interested in science and technology fields. I have gained experience engaging the public in environmental issues through collaboration with the University of Minnesota Extension and work on freshwater sponge projects that have been funded through LCCMR.

Organization: U of MN - Crookston

Organization Description:

The Center for Rural Education in Science and Technology (CREST) was established at the University of Minnesota Crookston Campus in 2022 to allow surrounding underserved, underrepresented schools to afford equal opportunities in the fields of Science, Technology, Engineering and Math. Our focus is on enhancing, improving and impacting STEM accessibility in education. We provide professional development, classroom instruction, STEM competition support and

on-campus educational opportunities for students and educators in grades 6-12. CREST plans to enrich student learning with hands-on inquiry, enhance the preparation of new and practicing teachers, model innovative instructional design and learning environments, conduct rigorous STEM education research, and collaborate with industry and organizations to strengthen STEM initiatives across the region and state.

Budget Summary

Category / Name	Subcategory or Type	Description	Purpose	Gen. Ineligible	% Benefits	# FTE	Classified Staff?	\$ Amount
Personnel								
Amber Murry		STEM Outreach Coordinator, 2 month summer salary Year 1 (Base Salary=\$50,998 for 10 month appointment), 100% FTE Years 2 & 3 (Base Salary=\$61,672 for 12 month appointment).			32%	2.25		\$177,000
Timothy Dudley		Principle Investigator/Project Manager, 2 months summer salary for Years 1-3 (Base Salary=\$83,814 for 9 month appointment). \$25,478 per year including fringe			36.8%	0.66		\$77,000
Anthony Schroeder		Co-Principle Investigator, 2 months summer salary for Years 1-3 (Base Salary=\$78,563: 9 month appointment). \$23,883 per year including fringe			36.8%	0.66		\$72,000
Undergraduate Assistants		Stipends for undergraduate students who will assist the CREST team with both school year and summer activities (2 students, 500 hours per year for 3 years at \$15)			0%	6		\$45,000
							Sub Total	\$371,000
Contracts and Services								
							Sub Total	-
Equipment, Tools, and Supplies								
	Equipment	Virtual Reality Headsets, 30 total	Headsets will be used to visualize different landforms and explore their features in 3-D					\$17,000
	Equipment	Microscopes (Camera, Stereo, and Digital), 12 total	These will be used to visualize small organisms, plants, and rocks in the environment					\$4,000
	Equipment	Watershed model and Stream Tables	This will be used to model water formations and how they interact with land formations					\$2,000
	Tools and Supplies	Environmental sampling supplies (vials, bottles, chemicals)	These consumable items will be used to collect soil, water, sediment samples during field trips					\$4,000

	Tools and Supplies	Land Formation Modeling Supplies (sand, erosion models)	These consumable items will be used when modeling land formations					\$2,000
							Sub Total	\$29,000
Capital Expenditures								
		Trailer	This trailer will be a mobile lab and will store equipment for traveling to schools	X				\$40,000
							Sub Total	\$40,000
Acquisitions and Stewardship								
							Sub Total	-
Travel In Minnesota								
	Miles/ Meals/ Lodging	Travel to remote sites with mobile lab (5000 miles per year for 3 years at \$0.655 IRS rate)	CREST team will be traveling to schools during the school year and county fairs during the summer in NW MN					\$10,000
	Miles/ Meals/ Lodging	Lodging for CREST team on longer trips (2 rooms per trip, 10 trips per year, \$150 per room)	Hotels will be needed for some trips to schools or county fairs that are far away from UMC (> 150 miles)					\$9,000
							Sub Total	\$19,000
Travel Outside Minnesota								
							Sub Total	-
Printing and Publication								
							Sub Total	-
Other Expenses								
							Sub Total	-
							Grand Total	\$459,000

Classified Staff or Generally Ineligible Expenses

Category/Name	Subcategory or Type	Description	Justification Ineligible Expense or Classified Staff Request
Capital Expenditures		Trailer	<p>This item is required in order for a mobile lab to be created to travel to schools and provide educational experiences</p> <p>Additional Explanation : This item will be use in perpetuity as a mobile lab, as long as CREST is operational and the trailer is functional</p>

Non ENRTF Funds

Category	Specific Source	Use	Status	Amount
State				
			State Sub Total	-
Non-State				
			Non State Sub Total	-
			Funds Total	-

Attachments

Required Attachments

Visual Component

File: [2c1d7aee-a84.pdf](#)

Alternate Text for Visual Component

Attached is the CREST promotional/recruitment flyer that includes services we provide, example projects, photos and link to CREST website....

Optional Attachments

Support Letter, Photos, Media, Other

Title	File
Dudley Board Resolution Letter	d648eb37-180.docx
Dudley Fiscal Agent Resolution	eb6c30f1-7cb.docx

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?

No

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

