



Environment and Natural Resources Trust Fund

M.L. 2024 Approved Work Plan

General Information

ID Number: 2024-177

Staff Lead: Tiffany Schaufler

Date this document submitted to LCCMR: June 5, 2024

Project Title: Rural Minnesota Mobile Lab: Environmental-Focused Earth Science Education

Project Budget: \$459,000

Project Manager Information

Name: Timothy Dudley

Organization: U of MN - Crookston

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Project Reporting

Date Work Plan Approved by LCCMR: June 20, 2024

Reporting Schedule: June 1 / December 1 of each year.

Project Completion: June 30, 2027

Final Report Due Date: August 14, 2027

Legal Information

Legal Citation: M.L. 2024, Chp. 83, Sec. 2, Subd. 05p

Appropriation Language: \$459,000 the second year is from the trust fund to the Board of Regents of the University of Minnesota, Crookston, to create a mobile lab and deliver innovative standards-based environmental education to students and educators at underserved, underrepresented schools and at community events in northwest Minnesota.

Appropriation End Date: June 30, 2027

Narrative

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

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 (e.g., virtual-reality headsets). 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 have purchased a trailer to use for the mobile lab and are requesting funds to renovate this trailer to make it a functioning mobile lab.

Another need 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 schools with the mobile lab.

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.

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

Activities and Milestones

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

Activity Budget: \$155,000

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 utilizes networking opportunities to recruit schools and teachers such as the MN Science Teachers Association conference. 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. These events allow us to network and recruit more participants. Each year of the grant period we will conduct a mid-year and end of year assessment to gather feedback about 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. While most Northwest Minnesota communities would be consider underserved and/or underrepresented due to their rural locations, CREST does not exclude communities that request our assistance. 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

Activity 3: CREST Mobile Lab: Purchasing and Customization**Activity Budget:** \$40,000**Activity Description:**

CREST has an agreement with Chameleon Concessions for the purchase and customization of a trailer to utilize as a Mobile Lab. We were able to purchase the trailer using funds from other CREST donors, we are requesting funds to convert this trailer into a mobile lab. The Mobile Lab will be an enclosed trailer (similar to a food truck) that will be outfitted as a laboratory setting. The Mobile Lab will include stainless steel counter tops, epoxy flooring, power hookups, storage, service window, lighting, air handling and water service. Modifications will also include an ADA compliant station as well as proper lab safety equipment.

Activity Milestones:

Description	Approximate Completion Date
Customization and Outfitting of Mobile Lab Trailer	July 31, 2024

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

Dissemination

Describe your plans for dissemination, presentation, documentation, or sharing of data, results, samples, physical collections, and other products and how they will follow ENRTF Acknowledgement Requirements and Guidelines.

We provide educational resources and services free of charge to any educator that is interested. We are in constant contact with school administrators, teachers, and homeschool groups about services we provide. We anticipate being involved in University of Minnesota media and educational campaigns and will look to find other public forums where we can present the work that is being supported by this LCCMR Grant. This proposal includes assessments of the impact of our activities on students increased interest in STEM fields. We will collaborate with educators to determine the impact of the proposed activities on their educational success within STEM fields. While this project does not involve original research, we hope to present our findings at professional education conferences.

Acknowledgement of ENRTF and logo will occur in all presentations, publications, social media and CREST website; as per the ENRTF acknowledgment guidelines. The ENRTF color logo will be included on the Mobile Lab trailer wrapping.

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, allowing us to purchase the trailer we intend to convert into a mobile lab. 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

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 2 years at \$15, 1 student, 500 hours per year for 1 year at \$15)			0%	5.01		\$37,500
Temporary and Casual Employee		This category is for undergraduate students who graduate and wish to work the summer after graduation. They are crucial to maintaining continuity in our summer projects. (1 employee, 400 hours for 1 summer at \$17.5, includes fringe)			8%	1		\$7,500
							Sub Total	\$371,000
Contracts and Services								
Chameleon Concessions	Professional or Technical Service Contract	Chameleon Concessions will be outfitting the trailer purchased for the mobile lab. This will include installing a new floor, adding cabinetry, bench space, a handicap accessible station, electrical, and water. This is a capital request in that much of the cost will be materials used to modify the trailer.		X		0		\$40,000
							Sub Total	\$40,000
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	X					\$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								
								Sub Total	-
	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
Contracts and Services - Chameleon Concessions	Professional or Technical Service Contract	Chameleon Concessions will be outfitting the trailer purchased for the mobile lab. This will include installing a new floor, adding cabinetry, bench space, a handicap accessible station, electrical, and water. This is a capital request in that much of the cost will be materials used to modify the trailer.	This item is required in order for a mobile lab to be created to travel to schools and provide educational experiences that aren't available to underserved schools.
Equipment, Tools, and Supplies		Virtual Reality Headsets, 30 total	<p>These headsets will be used to provide 3-D virtual experiences for students at any location that has internet access (e.g., schools, libraries). Understanding landforms is more easily understood by engaging in a "real-world" experience, which may not be possible due to geographical location and/or cost. These headsets will provide a more "real-world" experience compared to 2-D learning (e.g., books). The expense of purchasing these headsets is going to be too large for most of the schools we will be working with.</p> <p>Additional Explanation : These headsets will be used for providing educational experiences as long as they are functional and CREST is in existence</p>

Non ENRTF Funds

Category	Specific Source	Use	Status	\$ Amount
State				
			State Sub Total	-
Non-State				
In-Kind	Northwest MN Foundation, Society for Science	Funds from these donors were used to purchase the trailer that will be used for the mobile lab. Initially they were intended to help with renovations, now we plan to use LCCMR funds entirely for renovation of the trailer.	Secured	\$17,000
			Non State Sub Total	\$17,000
			Funds Total	\$17,000

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....

Supplemental Attachments

Capital Project Questionnaire, Budget Supplements, Support Letter, Photos, Media, Other

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

Media Links

Title	Link
University of Minnesota Crookston C.R.E.S.T. Website	https://sites.google.com/crk.umn.edu/crest/home

Difference between Proposal and Work Plan

Describe changes from Proposal to Work Plan Stage

The dissemination plan has been completed. The title of the project was changed at the request of LCCMR and reflects what is in the appropriations language.

Activities 1 and 2 have been updated to address reviewer comments related to recruitment and underserved, underrepresented communities. A new activity was added to highlight the Mobile Lab purchase and customization as requested in reviewer comments. The dissemination has been updated per reviewer comments.

Feb. 2024: Since we have purchased the actual trailer (with no modifications), we are now just requesting funds to modify the trailer to serve as a mobile lab. We have removed narrative material that mentions purchasing the trailer and have included the trailer purchase as in-kind support. We also adjusted the VR headsets to an ineligible expense and justified why we need to make the purchase. Both comments have been addressed in the budget.

May 2024: We have shifted funds from the undergraduate student salary category to a temporary employee salary category (\$7500 total). We often have undergraduate students who graduate and wish to spend the following summer working on our research and outreach projects. They are compensated in a similar fashion as undergraduates, but we do have to pay a small amount of fringe benefits. These graduates are crucial in helping us train new students and maintain the quality of our program. There was not overall change in the personnel budget.

Additional Acknowledgements and Conditions:

The following are acknowledgements and conditions beyond those already included in the above workplan:

Do you understand and acknowledge the ENRTF repayment requirements if the use of capital equipment changes?

N/A

Do you agree travel expenses must follow the "Commissioner's Plan" promulgated by the Commissioner of Management of Budget or, for University of Minnesota projects, the University of Minnesota plan?

Yes, I agree to the UMN Policy.

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

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 pre-design, design, construction, or renovation of a building, trail, campground, or other fixed capital asset costing \$10,000 or more or large-scale stream or wetland restoration?

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 as "the provision of care, treatment, education, training, instruction, or recreation to children")?

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