Environment and Natural Resources Trust Fund

2026 Request for Proposal

General Information

Proposal ID: 2026-563

Proposal Title: Red Lake Nation Long-Term Continuous Monitoring Buoys

Project Manager Information

Name: Mindy Phillips

Organization: Red Lake Band of Chippewa Indians

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Project Basic Information

Project Summary: Red Lake Nation will install three long-term buoys on Upper and Lower Red Lakes and Lake of the Woods to continuously monitor real-time publicly available water quality data.

ENRTF Funds Requested: $1,033,000

Proposed Project Completion: June 30, 2031

LCCMR Funding Category: Water (B)

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?

Region(s): NW

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.

The Red Lake Department of Natural Resources (RLDNR) Water Resources Program monitors lake water quality on the Red Lakes and Lake of the Woods fortnightly from May through October and once in winter, assessing parameters like temperature and chemistry. Available equipment and staff resources limit this seasonal data collection, and the data's non-continuous nature makes it challenging to draw meaningful conclusions.

The program uses simple, continuous sensors for data collection with no real-time communication to partially remedy these data challenges. If these sensors malfunction or their batteries expire, issues may not be discovered until the season ends. This can lead to substantial gaps in data, hindering accurate assessments of water quality and ecosystem health.

A major concern is the risk of harmful algal blooms (HABs) in project lakes, which remain only occasionally monitored, with results often produced after the threat has passed. These HABs can pose serious health risks to aquatic life, ecosystem homeostasis, and humans. Without regular monitoring, the RLDNR cannot identify, track, or alert the public to these dangerous blooms, risking ecosystem health and public safety.

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.

Integrating fluorometers into the monitoring program would enable the RLDNR to detect and assess HABs in real-time. Additionally, monitoring signs of HABS and creating models to predict HABs based on real-time data will greatly benefit public health by allowing staff to quickly inform the community about potential HABs in areas where recreational activities may pose health risks. By implementing precautionary measures, the RLDNR can better protect public safety and promote responsible interactions with lake environments, ensuring the ecosystem and the community remain safe. In addition, real-time data indicating potential algal blooms or internal loading events triggered by anoxic conditions can help focus monitoring efforts on peak bloom conditions, replacing the random schedule currently dictating monitoring dates.

The proposed buoys have real-time monitoring technology that immediately alerts staff to equipment failures or malfunctions, which is important for maintaining the integrity of the data collected. Continuous, uninterrupted data collection throughout the year could expand monitoring efforts and the resulting analyses of the data collected. Adopting continuous monitoring buoys that operate year-round would significantly enhance the program's ability to collect comprehensive environmental data, provide a more complete ecological overview, and help ease some pressure on staff resources.

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?

This project will provide more precise insights into stratification, hypoxia, and related nutrient loading contributing to the formation of HABs. It will enhance understanding of phosphorous loading and sources and even enable insights into shoreline erosion through wave monitoring. Continuous monitoring of critical parameters like water chemistry, wave and weather factors, and cyanobacterial pigments not only allows more appropriate management of the water resource and insights into climate change but can also provide the ability to protect human health and safety through early HAB alerts, and offers tools to local economies dependent on fisheries and tourism.

Activities and Milestones

Activity 1: Purchase and Deployment of Buoys and Sensors.

Activity Budget: $350,000

Activity Description:
Coordinate with manufacturers and distributors of buoy bases, mooring equipment, telemetry, and sensor probes to ensure the timely procurement and delivery of parts to the Red Lake DNR. Assemble the buoys and sensor strings and prepare them for deployment.
Coordinate the deployment of assembled buoys at the three project lake locations. Perform initial operational checks of the buoys, telemetry, and data hosting system tests. RLDNR staff will perform duties at Red Lakes sites.

Activity Milestones:

Description	Approximate Completion Date
Source, procure, and assemble buoy and sensor strings.	September 30, 2026
Coordinate the deployment and successful initiation of buoy operations at the three sites.	November 30, 2026

Activity 2: Signage and informational flyers.

Activity Budget: $5,100

Activity Description:
Purchase and install signs at applicable locations to warn and inform boaters and other lake users of the buoys' presence, purpose, and ownership.
Coordinate creating and distributing informational flyers that describe the buoys' purpose, location, and output. These flyers will be distributed in the communities surrounding the project lakes and include information about Harmful Algal Blooms (HABs) and alert systems.

Activity Milestones:

Description	Approximate Completion Date
Purchase and install signs	November 30, 2026
Distribute informational flyers in communities surrounding project lakes.	March 31, 2027

Activity 3: Buoy Maintenance and Troubleshooting

Activity Budget: $20,000

Activity Description:
Perform regular maintenance and troubleshooting of buoys and sensors, including but not limited to installation and retrieval of buoys, mooring, or sensors; investigating the cause of failures or errors; repairing or replacing buoys or buoy parts, mooring or mooring parts, sensors and sensor parts including batteries, telemetry or telemetry parts including batteries.

Activity Milestones:

Description	Approximate Completion Date
Perform maintenance and troubleshooting as needed	June 30, 2031

Activity 4: Manual Water Quality Sampling and Lab Analysis

Activity Budget: $200,000

Activity Description:
Water quality samples at each buoy location will be taken as calibration standards. Water quality samples will be analyzed for chemistry and toxins. Data from manual water quality samples will be used to inform prediction thresholds for statistical model development.

Activity Milestones:

Description	Approximate Completion Date
Red Lake Manual Sampling	June 30, 2031
Lake of the Woods Manual Sampling	June 30, 2031
Lab Analysis of Manual Samples	June 30, 2031

Activity 5: Modeling, Data Analysis, Data Reporting, and Publication

Activity Budget: $300,000

Activity Description:
Buoy data will be compared to long-term historical monitoring data and contemporaneous monitoring parameters to calibrate buoy output. Statistical model threshold determinations for nuisance and toxin-producing algae blooms will be produced for each lake.
Data from the latest recording period will be downloaded and compiled into a template format for future reporting.
Data from the latest recording period will be analyzed and reported to the RLDNR.
The postdoc hire (TBD) will prepare a peer-review draft detailing models of interest or utility related to HAB prediction to be submitted for publication.

Activity Milestones:

Description	Approximate Completion Date
Sensor calibration and predictive modeling	June 30, 2028
Data compilation	June 30, 2031
Data analysis and reporting	June 30, 2031
Preparation of publication materials	June 30, 2031

Activity 6: Progress Reports, Final Report, and Project Deliverables

Activity Budget: $157,900

Activity Description:
Provide a progress project report annually or as required by the grant agreement. Provide a final grant project report after the project. Provide electronic files of all project deliverables to the ENRTF grant manager or authorized representative before the end of the grant agreement on June 30, 2025, or after the project, whichever occurs first.

Activity Milestones:

Description	Approximate Completion Date
Submit Progress Reports	June 30, 2031
Submit Final Report	June 30, 2031
Submit Project Deliverables	June 30, 2031

Project Partners and Collaborators

Name	Organization	Role	Receiving Funds
Adam Heathcote	Science Museum of Minnesota, St. Croix Watershed Research Station	As director of the St. Croix Watershed Research Station and an expert in limnology and ecosystem ecology, Adam will coordinate the synthesis of data and monitoring programs, contextualize this work within the long-term monitoring programs of Lake of the Woods and Red Lake, and supervise the postdoctoral fellow position.	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?

Data from the buoys will be integrated into existing monitoring programs and reported. Data from the buoys will continue to enhance water quality assessments and drive the development of improved models for predicting HABs. HAB monitoring and alert systems will continue to provide timely warnings, publicly available through a web platform. Internal resources will be allocated for continued operation and maintenance. We will continue to apply for funding opportunities to develop the continuous monitoring buoy fleet. Any extra work needed will be funded through internal resources, existing program funds, or supplemental grants.

Other ENRTF Appropriations Awarded in the Last Six Years

Name	Appropriation	Amount Awarded
Reconstructing Historical Wild Rice to Understand Its Future	M.L. 2024, , Chp. 83, Art. , Sec. 2, Subd. 03b	$200,000

Project Manager and Organization Qualifications

Project Manager Name: Mindy Phillips

Job Title: Climate Change Specialist

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

Mindy Phillips will lead the management, coordination, and execution of all tasks associated with this project. She holds a master's in biology, providing her with a solid foundation in scientific principles and research methodologies. With over three years of experience, Mindy has successfully collaborated with multidisciplinary teams from various fields, demonstrating her ability to facilitate effective communication and teamwork in pursuit of project goals. Mindy is spearheading multiple projects and initiatives at the Red Lake Department of Natural Resources (RLDNR), where she has been employed since August 2024. In this capacity, she has made substantial advances toward developing a comprehensive climate adaptation plan, a vulnerability assessment, solar energy initiatives, and an electric vehicle fleet replacement initiative.

Organization: Red Lake Band of Chippewa Indians

Organization Description:

The Red Lake Band of Chippewa Indians is a federally recognized Indian tribe. The Red Lake Reservation encompasses over 840,000 acres of land and water which spans across eight Northern Minnesota counties. The reservation completely surrounds Lower Red Lake, the state's largest lake, and includes a major portion of Upper Red Lake. The Red

Lake Reservation retains the only contiguous, unalloted reservation in Minnesota. Red Lake is one of only a few tribes in the U.S. that resisted allotment, and the Tribe holds all land in common for the benefit of its members. The Red Lake Reservation is home to 75 percent of the Tribe's 10,000 Band members. The primary sources of livelihood include hunting, fishing, and subsistence natural resource harvesting. Natural resources historically represented the most important source of employment to the Band members, with commercial fishing and logging representing the two most important industries. These two industries affect every member on the Reservation. Therefore, preserving and restoring its rich aquatic ecosystem and abundance of other natural resources is critical to Band members' health, welfare, traditional ways of life, and economic viability and is a high priority for the Band.

Budget Summary

Category / Name	Subcategory or Type	Description	Purpose	Gen. Ineligible	% Benefits	# FTE	Classified Staff?	$ Amount
Personnel								
Mindy Phillips		Climate Change Specialist, RLDNR: Mindy will be the project lead/manager. She will coordinate and ensure the execution of all tasks related to the project.			35%	2		$162,000
Shane Bowe		Water Resources Director, Red Lake DNR: Shane will perform buoy maintenance, installation and troubleshooting, and perform manual sampling at the Red Lakes sites.			0%	0.25		-
							Sub Total	**$162,000**
Contracts and Services								
Science Museum of Minnesota, St. Croix Watershed Research Station	Subaward	Postdoctoral Fellow will be responsible for the HAB Prediction Model development, and the preparation for publication of all hypothesis-driven research.				2		$158,000
Science Museum of minnesota, St. Croix Watershed Research Station	Subaward	Adam will coordinate and synthesize buoy data with long-term monitoring programs and complimentary manual sampling, and supervise/oversee the postdoctoral fellow position (TBD)				0.5		$35,000
Lake of the Woods Soil and Water Conservation District, or competitive bid TBD	Service Contract	SWCD staff will provide regular installation, maintenance, troubleshooting, and serviceing of buoy at Lake of the Woods site, and also provide manual sampling at this site.				0.25		$41,000
							Sub Total	**$234,000**

Equipment, Tools, and Supplies								
	Tools and Supplies	Sign bases and posts	To display signs, public education and interpretation of buoys					$2,400
							Sub Total	**$2,400**
Capital Expenditures								
		Three (3) Buoys, including bases, sensors, mooring packages, and telemetry packages.	to continuously collect and transmit water quality data on Upper Red Lake, Lower Red Lake, and Lake of the Woods.	X				$283,700
							Sub Total	**$283,700**
Acquisitions and Stewardship								
							Sub Total	**-**
Travel In Minnesota								
	Miles/ Meals/ Lodging	Travel for 3 people over five years, 700 miles at 0.76/milex4, boat rental at $600/day x12 days/year,	Travel for sampling, installation and maintenance of buoys, and for boat rental to access buoy on Lake of the Woods.					$48,550
							Sub Total	**$48,550**
Travel Outside Minnesota								
							Sub Total	**-**
Printing and Publication								
	Printing	Printing of approximately 6000 flyers	Flyers for public education about buoys, for distribution into surrounding communities					$900
	Printing	durable signage	for display at landings/public interaction points on Upper and Lower Red Lakes, for public education about the buoys					$1,800

							Sub Total	**$2,700**
Other Expenses								
		Lab Services	Lab Services for analyzing chlorophyll-a, DIC/DOC, DIN, TP/TN, SRP, DSi, 4 toxins; $8488 each and two per year per lake over 5 years					$254,650
		Data Hosting	Annual costs for Limnotech web hosting of real-time buoy data, $3000 Per buoy per year for $9000 total per year for five years.					$45,000
							Sub Total	**$299,650**
							Grand Total	**$1,033,000**

Classified Staff or Generally Ineligible Expenses

Category/Name	Subcategory or Type	Description	Justification Ineligible Expense or Classified Staff Request
Capital Expenditures		Three (3) Buoys, including bases, sensors, mooring packages, and telemetry packages.	These buoys are the core element of this project; they will collect the data that will be used for long term monitoring and HAB prediction. **Additional Explanation :** The buoys have an expected life span of approximately 10 years. The RLDNR and LoW water quality monitoring programs will continue to utilize and maintain the buoys for as long as they are serviceable. The RLDNR water quality program's base funding will fund any maintenance and operating costs after the grant period.

Non ENRTF Funds

Category	Specific Source	Use	Status	Amount
State				
			State Sub Total	**-**
Non-State				
In-Kind	Red Lake DNR Water Resources Program	Shane's time to install, troubleshoot, and maintain buoys, and to perform sampling on Red Lakes.	Secured	$60,531
In-Kind	St. Croix Watershed Research Station	Adam's time to provide lab services for sample analysis	Secured	$34,233
In-Kind	Red Lake DNR Water Resources Program	Shane's travel to and from sampling sites over 5 years.	Secured	$2,500
In-Kind	Red Lake DNR Water Resources Program	Red Lake Administrative Costs calculated at 30% of total RLDNR Salaries before fringe and indirect) pays for administrative staff not directly involved with project duties (i.e. payroll)	Secured	$35,804
In-Kind	Red Lake DNR Water Resources Program	costs of use of equipment and tools to perform manual sampling on Red Lakes and Lake of the Woods	Secured	$150,000
In-Kind	Red Lake DNR Water Resources Program	Red Lake indirect costs, calculated at EPA NICRA rate of 17.62% of Red Lake Salaries.	Secured	$39,054
In-Kind	St. Croix Watershed Research Station	SCWRS indirect costs	Secured	$215,196
In-Kind	Red Lake DNR Water Resources Program	Contingency	Secured	$85,913
			Non State Sub Total	**$623,231**
			Funds Total	**$623,231**

Total Project Cost: $1,656,231

This amount accurately reflects total project cost?

Yes

Attachments

Required Attachments

Visual Component

File: f6d0c80f-403.pdf

Alternate Text for Visual Component

A map of north-central Minnesota, centered on Red Lake, with Lake of the Woods visible. the map displays three proposed, approximate locations for buoy installation....

Board Resolution or Letter

Title	File
Red Lake Tribal Council Resolution Supporting Buoy Project LCCMR Application	436adbad-7f9.pdf

Supplemental Attachments

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

Title	File
Red Lake Band Audit 2020	f505ea13-7ae.pdf
Red Lake Band General Fund budget, 2025 summary	1d09aead-32c.pdf
St. Croix Watershed Research Station Letter of Support	69fb5c3d-7a6.pdf
MPCA Letter of Support	bb8de0f7-3be.pdf
Lake of the Woods SWCD Letter of Support	0b9be227-3b9.pdf

Administrative Use

Does your project include restoration or acquisition of land rights?

No

Do you understand that travel expenses are only approved if they 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 understand the Commissioner's Plan applies.

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?

Yes

Does the organization have a fiscal agent for this project?

No

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")?

No

Provide the name(s) and organization(s) of additional individuals assisting in the completion of this proposal:

Mindy Phillips, Red Lake Department of Natural Resources

Do you understand that a named service contract does not constitute a funder-designated subrecipient or approval of a sole-source contract? In other words, a service contract entity is only approved if it has been selected according to the contracting rules identified in state law and policy for organizations that receive ENRTF funds through direct appropriations, or in the DNR's reimbursement manual for non-state organizations. These rules may include competitive bidding and prevailing wage requirements

Yes, I understand