Environment and Natural Resources Trust Fund

2022 Request for Proposal

General Information

Proposal ID: 2022-063

Proposal Title: Website Development: Statewide Sediment Estimates Improves River Restoration

Project Manager Information

Name: Joel Groten

Organization: US Geological Survey - Upper Midwest Water Science Center

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Project Basic Information

Project Summary: Develop a publicly accessible website tool to estimate sediment in Minnesota's Rivers lacking sampled data. This website is needed by the public and resource managers for river protection and restoration.

Funds Requested: $250,000

Proposed Project Completion: June 30 2024

LCCMR Funding Category: Water Resources (B)

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

Narrative

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

Many of our rivers, streams, and lakes have impairments directly related to excess sediment. Understanding river sediment is critical to solving these problems such as degradation of aquatic habitat, exacerbated flooding, excess nutrients, harmful algae blooms, impairment to aquatic recreation, loss of soil, and the economic challenges of restoring these systems. Since 2007, the USGS in collaboration with MNDNR and MPCA have collected more accurate sediment data with more comprehensive methods than what is required by the State's water quality standard. These sampling and laboratory methods are more accurate because they measure and analyze the entire sediment load (suspended sediment and bedload) while the methods used as part of the State's water quality standard (total suspended solids) measures and analyze a small fraction (fines) of the entire sediment load. More accurate data allows for better decisions to protect and restore our rivers. However, not enough accurate data has been collected by USGS, MNDNR, MPCA to inform resource management decisions about rivers lacking sediment data. Also, it is not feasible and too expensive to collect data at every river. Therefore, a tool is needed to provide sediment estimates from previously collected data to restore health to Minnesota's rivers.

What is your proposed solution to the problem or opportunity discussed above? i.e. What are you seeking funding to do? You will be asked to expand on this in Activities and Milestones.

Developing a website tool to estimate suspended sediment, bedload, annual total sediment loads, and determine important basin, near-channel, and in-channel characteristics at streams where sampled data are not available would provide an important tool given that sampling at every river of interest is not feasible. The proposed project builds on existing field data collected and analyzed through collaborative efforts between the MNDNR, MPCA, and USGS.
The state of Minnesota has invested over seven million dollars with additional funds provided by USGS to collect and analyze sediment data. Due to funding constraints at the MNDNR, the website tool cannot be developed and published as originally planned. Therefore, we are seeking funding to develop a State of Minnesota website. The website will help anyone interested in river sediment and can be a guide to restoring our waters. Concerned and or interested citizens, consultants, local, and State resource managers can use these estimates for a variety of applications centered around improving or understanding streams, rivers, and lakes. For example, estimates can be compared to proposed stream restoration designs to determine the most successful design or how fast a lake will fill-in with sediment after being dredged.

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?

The outcome will be a one of a kind, easy to use, and publicly available website. Users would be able to select rivers of interest in Minnesota, and the site will produce estimates of suspended sediment, bedload, annual total load estimates, and important basin, near-channel, and in-channel characteristics. The website will be essential to resource managers who are tasked with protecting and restoring our rivers and to citizens who are interested in the condition of their river resources. This website will provide invaluable estimates based on previously collected samples to help with many protection and restoration activities.

Activities and Milestones

Activity 1: Developing, Testing, and Publishing an Accessible and Easy to use Website for Resource Managers and the Public

Activity Budget: $250,000

Activity Description:
A publicly available State of Minnesota website will be developed, tested, and published. The website will integrate the analyses developed by previous State and Federally funded work with an assembled geospatial dataset to estimate suspended sediment and bedload. This work will use several thousand values of suspended sediment, bedload, and streamflow that have been collected from over 50 sites across Minnesota to develop a State of Minnesota Statewide website to be hosted by a State agency to estimate sediment information for river locations lacking measured data. In-channel, near-channel, and watershed characteristics have been extracted from available geospatial datasets, and analyses and a report are currently being developed. The report will be published in late 2021 and will be the website's foundation. The website will also integrate with USGS StreamStats which is already used by many water resources professionals in Minnesota. DNR, MPCA, and USGS will work together to plan the functionality of the website. Selected staff will provide testing for the website and will provide comments back to USGS website developers to improve the functionality. Additionally, select watershed district employees, private consultants, and members of the public will be invited to test the functionality of the website before publication.

Activity Milestones:

Description	Completion Date
Website Development	December 31 2023
Beta Testing	March 31 2024
Publication of Website	June 30 2024

Project Partners and Collaborators

Name	Organization	Role	Receiving Funds
Ian Chisholm	Minnesota Department of Natural Resources	Will facilitate with MNDNR to host this web application on MNDNR website. Will help guide the functionality and provide specific application guidelines for the website. Will also test the website and provide suggested improvements to website developers.	No
Gregory Johnson	Minnesota Pollution Control Agency	Will help guide the functionality and provide specific application guidelines for the website. Will also test the website and provide suggested improvements to website developers.	No
Karl Koller	Minnesota Department of Natural Resources	Will help guide the functionality and provide specific application guidelines for the website. Will also test the website and provide suggested improvements to website developers.	No
Nick Proulx	Minnesota Department of Natural Resources	Will help guide the functionality and provide specific application guidelines for the website. Will also test the website and provide suggested improvements to website developers.	No

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 be funded?

The results will be implemented on a publicly available state of Minnesota website. A user will be able to click on rivers of interest and the estimated suspended sediment, bedload, and annual total load estimates will be presented to the user. The USGS and DNR will fund the website long-term. The website will only cost approximately $7,500 per year for the server space and maintenance to host the website. Also, a small sampling program will be maintained to check the validity of relations used to provide web-based estimates and will be funded by existing USGS cooperative projects.

Project Manager and Organization Qualifications

Project Manager Name: Joel Groten

Job Title: Hydrologist

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

Joel Groten is a Hydrologist with the U.S. Geological Survey (USGS) Upper Midwest Water Science Center in Minnesota. He has a M.S. in Water Resources Science from the University of Minnesota. Joel serves as a principal investigator related to USGS sediment and nutrient studies. He has been working with local, state, and federal partners in Minnesota for the past nine years. In this capacity, he provides project oversight, technical assistance, teaching, training, data analysis, and reporting in support of projects for the Minnesota Department of Natural Resources, Minnesota Pollution Control Agency, U.S. Army Corps of Engineers, Lower Minnesota Watershed District, Rice Creek Watershed District, and the Institute for Technological Research in São Paulo, Brazil. These projects vary in scope and relate to stream restoration, geomorphology, nutrient and sediment budgets, continuous data acquisition in real-time, aquatic habitat, TMDL studies, and flood retention and diversion. He has been a primary author of 5 peer-reviewed papers and a co-author on 3 peer-reviewed papers. Joel also is responsible for research and implementation of new technologies to improve understanding of sediment in rivers.

Organization: US Geological Survey - Upper Midwest Water Science Center

Organization Description:

The USGS works as a partner with state agencies towards collecting and analyzing a myriad of water quality data. The USGS is uniquely positioned to carry out the work for this project through its standard techniques and methods for collecting sediment data and experienced hydrologists, hydrologic technicians, and website developers. The USGS Upper Midwest Science Center has state-of-the-science expertise in the office and has access to the most current science and technology related data collection and analyses nationwide.

Budget Summary

Category / Name	Subcategory or Type	Description	Purpose	Gen. Ineligible	% Benefits	# FTE	Classified Staff?	$ Amount
Personnel								
Hydrologist		Principal Investigator/Project Manager will be responsible for overseeing entire project			30%	0.7		$75,000
Manager		Oversight of USGS Web Informatics and Mapping Team			30%	0.04		$6,650
Website Project Manager		Coordination of development efforts, tracking of project progress through project life-cycle			30%	0.08		$10,966
Front End Specialist		User interface styling and responsiveness			30%	0.2		$23,684
Student Worker		Assist with development and documentation			0%	0.3		$17,731
Developer		Assist with development and documentation			30%	0.36		$41,534
Senior Website Developer		Lead developer on the team, oversight on system architecture, framework selection, and development process			30%	0.36		$62,185
							Sub Total	**$237,750**
Contracts and Services								
							Sub Total	**-**
Equipment, Tools, and Supplies								
	Tools and Supplies	Website and hosting toolset includes cloud costs	Needed for for production and development environments and development tools licensing					$12,250
							Sub Total	**$12,250**
Capital Expenditures								
							Sub Total	**-**

Acquisitions and Stewardship								
							Sub Total	**-**
Travel In Minnesota								
							Sub Total	**-**
Travel Outside Minnesota								
							Sub Total	**-**
Printing and Publication								
							Sub Total	**-**
Other Expenses								
							Sub Total	**-**
							Grand Total	**$250,000**

Classified Staff or Generally Ineligible Expenses

Category/Name	Subcategory or Type	Description	Justification Ineligible Expense or Classified Staff Request

Non ENRTF Funds

Category	Specific Source	Use	Status	Amount
State				
In-Kind	In-kind staff time	MPCA in-kind staff time	Secured	$25,000
In-Kind	In-kind staff time	DNR in-kind staff time	Secured	$75,000
			State Sub Total	**$100,000**
Non-State				
Cash	USGS Cooperative Matching Funds	Used for USGS personnel costs	Secured	$100,000
			Non State Sub Total	**$100,000**
			Funds Total	**$200,000**

Attachments

Required Attachments

Visual Component

File: e2400893-63c.pdf

Alternate Text for Visual Component

Watershed Health Assessment Framework from MNDNR showing natural, altered, and impounded watercourses in Minnesota. The majority of watercourses are altered and have likely sediment impairments....

Optional Attachments

Support Letter or Other

Title	File
Letter of support from MPCA	5d5cee10-eed.pdf

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?

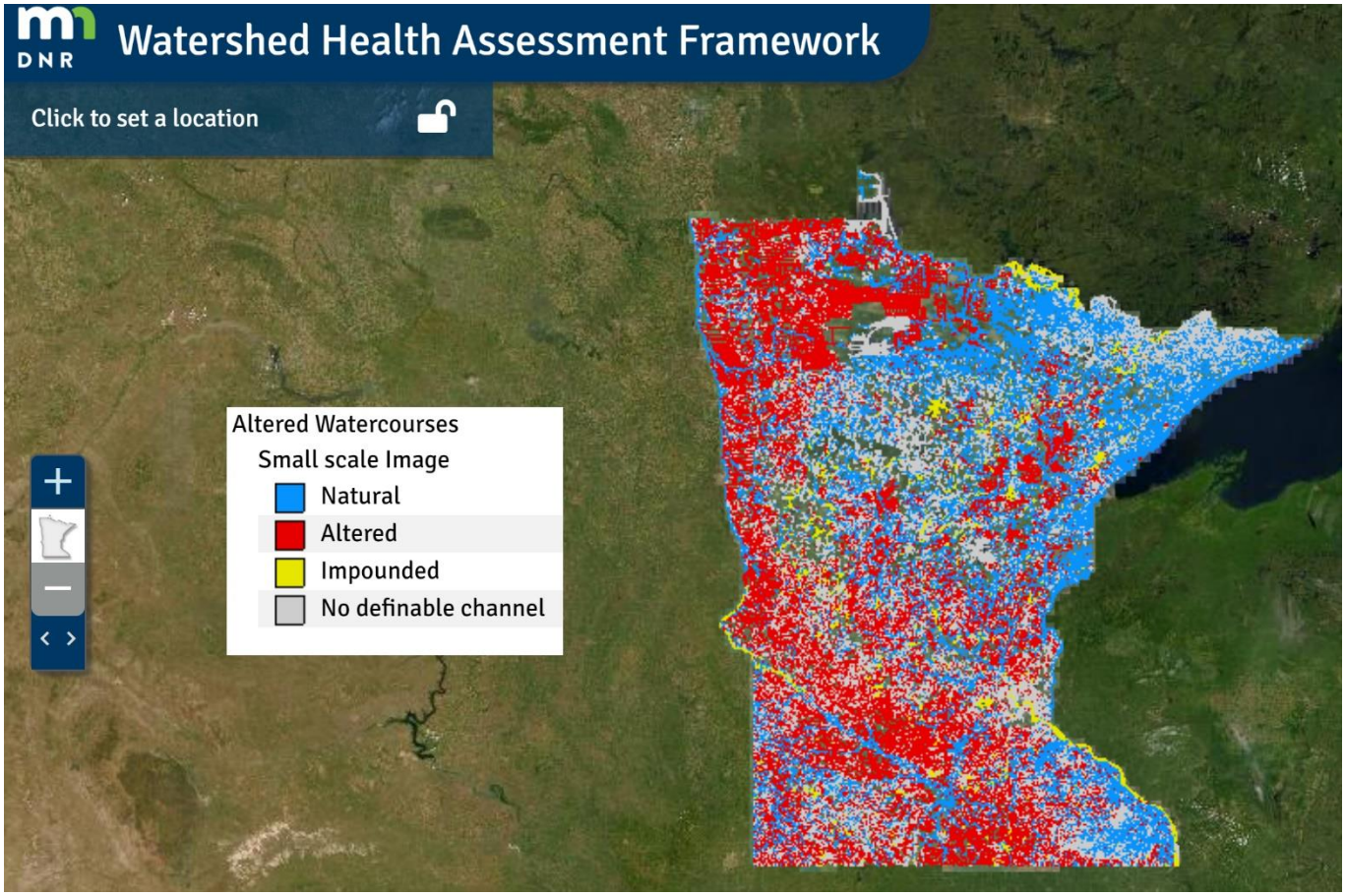
N/A

Does your project include original, hypothesis-driven research?

Yes

Does the organization have a fiscal agent for this project?

No


DNR
Watershed Health Assessment Framework
Click to set a location
Altered Watercourses
Small scale Image
Natural
Altered
Impounded
No definable channel