



Environment and Natural Resources Trust Fund

2025 Request for Proposal

General Information

Proposal ID: 2025-077

Proposal Title: Clean Sweep Solution to Nonpoint Source Pollution

Project Manager Information

Name: Maggie Karschnia

Organization: U of MN - Water Resources Center

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Project Basic Information

Project Summary: This project will result in long-term reduction of nonpoint source pollution in Minnesota's water resources by identifying opportunities to increase targeted street sweeping practices and removing barriers to implementation.

ENRTF Funds Requested: \$398,000

Proposed Project Completion: June 30, 2028

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 and In the Future

Narrative

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

Our streets are channeling pollutants into waterways. Stormwater runoff from roads often contains excess nutrients, sediment, chlorides, microplastics, PAHs, and other pollutants that lead to impaired conditions: leaves and organic matter feed algae blooms; sediment can pick up heavy metals from engines, brakes, and tires that pose ecological and human health problems; chlorides from de-icing salts are a permanent pollutant that is toxic to aquatic life; and microplastics pose health risks to humans and wildlife.

Once pollutants enter our waterways, they are difficult and costly to remove. Increased street sweeping helps remove these pollutants before they reach storm drains that often flow directly into lakes, streams, and wetlands. However, there are barriers preventing its implementation as a solution to water quality issues.

A lack of research on pollutant concentrations in street sweeping materials means that communities often choose to send materials to landfills rather than investing limited time and resources on cleaning and reusing what's swept off their streets. Insufficient space to store materials, limited reuse options, and expensive landfill fees discourage communities from investing in additional street sweeping. Communities need resources to help them cost-effectively reuse sweeping materials, develop effective street sweeping plans, and regionally coordinate on materials 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.

Proactively removing pollutants from streets before they enter storm drains wisely protects waterways before impairments occur, while also saving communities money, preserving their limited resources, and decreasing the pressure on Minnesota's landfills. To address the barriers that limit street sweeping's widespread implementation as a solution to water quality issues, this project aims to reduce the current gaps in research, guidance, and training by growing a new, emerging program.

In 2022, the U of M Water Resources Center and the MPCA launched the Clean Sweep Program that aims to assist communities in initiating enhanced street sweeping programs. This proposed project will provide funding to launch and support new areas of the program including:

- 1) a study to understand the pollutant composition in street sweeping materials,
- 2) exploration of new materials reuse options and facilitation of regional materials management collaborations,
- 3) planning assistance to communities to develop enhanced street sweeping plans, and
- 4) expansion of training efforts to reach communities state-wide, including the creation of new resources and tools.

As a partnership between the University researchers, Extension, industry/consultants, and state agencies, this project is uniquely positioned to foster long-term success and regional collaborations with lasting impacts throughout Minnesota.

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?

Through the creation and implementation of ten street sweeping plans in TMDL watersheds, the project will result in nonpoint source pollution reduction in stormwater with over 1,200 pounds of phosphorus and 5,000 pounds of nitrogen removal per year from enhanced street sweeping practices that will improve the water quality of downstream resources. Over 200 professionals will be trained in enhanced street sweeping practices and materials reuse options, and three new tools will be developed to support them. The project will identify cost-effective reuse options and facilitate regional materials reuse collaborations, which will decrease the burden on Minnesota's landfills.

Activities and Milestones

Activity 1: Identify the pollutants present in street sweeping materials and quantify benefits of enhanced street sweeping

Activity Budget: \$207,053

Activity Description:

The street sweeping materials from existing city stockpiles, archived samples from previous research, and current street sweeping practices will be sampled and analyzed to determine the concentrations of chemicals known to be harmful or toxic to humans and aquatic life, including heavy metals (from vehicle exhaust, worn engine parts, rust, etc.), persistent organic pollutants (from tree litterfall, erosion, etc.), microplastics (from city dust, tire wear, road markings, etc.), polycyclic aromatic hydrocarbons (PAHs from motor oil, tire particles, asphalt, etc.), and GRO/DRO (gasoline and diesel range organics). Samples will be solicited from street sweeping programs across the state to provide a comprehensive look at contaminants in a variety of subwatershed scenarios with different land uses, tree canopy covers, vehicle traffic, road types and conditions, etc.

The data will provide a detailed picture of what pollutants are in street sweeping materials, in what seasons they mostly occur, and in what subwatershed conditions they are most likely to be found. Results of the study will be shared on the Water Resources Center website, referenced in the Minnesota Stormwater Manual, presented at workshops, and published in an open access peer-reviewed journal article to make the information accessible to a broad community.

Activity Milestones:

Description	Approximate Completion Date
Design and launch a free materials testing program to gather state-wide samples of sweeping materials	January 31, 2026
Conduct outreach to cities with TMDLs to engage them in materials testing program	August 31, 2026
Receive, process, and test sweeping materials samples from across the state	December 31, 2026
Analyze data to determine risks and opportunities with street sweeping materials reuse	December 31, 2027
Disseminate the results via Minnesota Stormwater Manual, materials management guidance, workshops, and peer-reviewed journal article.	June 30, 2028

Activity 2: Provide assistance and tools to communities to create street sweeping plans that target water quality goals in TMDL watersheds

Activity Budget: \$94,067

Activity Description:

While traditionally the purpose of street sweeping programs are to maintain the functionality and longevity of roads and to keep streets clear and safe for users, enhanced street sweeping programs aim to target water quality goals and are a relatively new concept to communities. Enhanced programs will increase the number of times that roads are swept in targeted subwatersheds, sometimes doubling or tripling the typical sweeping rate, in order to achieve critical pollutant load reductions. To design an effective program, communities must first have a good understanding of their stormwater systems, be able to accurately map the tree canopy cover in right-of-ways, know their subwatershed boundaries, and be able to measure and communicate potential benefits to demonstrate cost-effectiveness to their local decisionmakers.

This project will provide technical assistance to communities to create enhanced street sweeping plans that target water quality goals. Ten communities in TMDL watersheds will be engaged to create enhanced street sweeping plans which will be used as case studies in the Minnesota Stormwater Manual. Guidance documents and supportive materials will be

developed from these case studies so that other cities can follow the same steps to create their own enhanced street sweeping plans.

Activity Milestones:

Description	Approximate Completion Date
Launch a community assistance program to fund ten enhanced street sweeping plans in TMDL watersheds	January 31, 2026
Conduct state-wide outreach for the community assistance program	June 30, 2026
Select and work with ten cities with TMDLs to create enhanced street sweeping plans	May 31, 2027
Provide technical assistance, resources and tools to communities to develop enhanced street sweeping plans	June 30, 2028
Evaluate and share effectiveness of ten street sweeping plans to reduce pollutant loading	June 30, 2028

Activity 3: Coordinate county and regional collaborations to accelerate reuse options for street sweeping materials and reduce the burden on landfills

Activity Budget: \$49,845

Activity Description:

Current state guidance for reusing street sweeping materials is based on our limited understanding of what pollutants can be found in these materials and at what levels. The research results from Activity 1 will be used to provide: 1) updated guidance documents by the MPCA for managing street sweeping materials; 2) additional reuse options for communities; and 3) cost-effective options to mitigate for pollutants, when possible and necessary.

The U of M will facilitate county/regional discussions across the state to explore cost-effective sorting, storage, and reuse options on a larger scale such as reusing salt/sand on roadways, composting coarse organics from sweepings, and using materials to grow pollinator habitat. The project aims to create a circular nutrient system that mimics the natural cycle, and reuses the organic material in street sweepings for beneficial reuse.

The project will also work with three cities to explore new reuse options for street sweeping materials, develop reuse plans for each city that meets their needs and goals, and create case studies from these efforts in the Minnesota Stormwater Manual to provide proven examples to other cities across the state.

Activity Milestones:

Description	Approximate Completion Date
Using Activity 1 results, engage three cities and their local partners to explore reuse options	June 30, 2027
Coordinate a technical advisory group to update guidance for managing and reusing street sweeping materials	September 30, 2027
Create fact sheets and online guidance to mitigate for common pollutants identified in Activity 1	December 31, 2027
Develop street sweeping material reuse plans for three cities based on their needs and goals	May 31, 2028
Facilitate three or more regional collaborations to explore reuse options and materials management partnerships	June 30, 2028

Activity 4: Deliver new trainings, tools and resources to support enhanced street sweeping across the state to improve water quality

Activity Budget: \$47,035

Activity Description:

The Clean Sweep Program is a new partnership between the MPCA and U of M that aims to provide resources and training to communities to initiate street sweeping programs that will help them meet their water quality goals by targeting their efforts where it counts the most. This project will provide new tools and resources for this program to help meet the needs of communities which were identified by a review of surveys, case studies and focus groups:

1. Training and informational videos for practitioners and local leaders
2. Street sweeping tracking tool to easily track sweeping efforts and to quantify water quality impacts
3. Online planning tool to calculate potential benefits and estimated costs of enhanced street sweeping
4. Clean sweep workshops that will provide in-person training opportunities and field tours of enhanced streets sweeping practices

Activity Milestones:

Description	Approximate Completion Date
Create and share training videos for practitioners and local leaders on Clean Sweep Program website	August 31, 2026
Develop and launch a street sweeping tracking tool to track and quantify water quality impacts	December 31, 2026
Build an online planning tool to help calculate potential benefits and costs of street sweeping	December 31, 2026
Create and share new resources for planning, materials management and reuse, and public engagement	December 31, 2027
Facilitate workshops across the state to share information and tools from Activities 1-5	May 31, 2028

Project Partners and Collaborators

Name	Organization	Role	Receiving Funds
Paula Kalinosky	Minnesota Pollution Control Agency	Project partner: Paula will help present at workshops, advise on research study, provide collaboration to help update MPCA guidance documents, direct appropriate updates and additions to the Minnesota Stormwater Manual, and provide input on tools and resources developed from the project.	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 work be funded?

The critical information developed on street sweeping material composition, along with the case studies, guidance documents and tools created, will continue to be shared on the Clean Sweep Program website and through the Minnesota Stormwater Manual after the project has ended. The Water Resources Center will continue to support and fund the Clean Sweep Program in collaboration with the MPCA, and both will work together to identify and develop additional resources and tools based on the project outcomes. Minnesota is a national leader in street sweeping as a pollution prevention practice and these resources will also have impacts nation-wide.

Other ENRTF Appropriations Awarded in the Last Six Years

Name	Appropriation	Amount Awarded
Managed Aquifer Recharge	M.L. 2019, First Special Session, Chp. 4, Art. 2, Sec. 2, Subd. 04t	\$350,000

Project Manager and Organization Qualifications

Project Manager Name: Maggie Karschnia

Job Title: Stormwater Extension Educator

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

As the stormwater extension educator for both the Water Resources Center and Minnesota Sea Grant at the University of Minnesota, Maggie Karschnia is responsible for planning, coordinating, and implementing the technology transfer components of the Minnesota Stormwater Research Program and leading watershed and stormwater education efforts targeted at practitioners, policymakers and the general public. She developed and currently leads the Clean Sweep Program which was created in 2022 in partnership with the Minnesota Pollution Control Agency. Prior to her work at the University of Minnesota, Maggie served for nearly seven years as the Prior Lake-Spring Lake Watershed District's Water Resources Project Manager. In that role, she led the regulation program, managed a range of water resource projects, created a citizen science program, and worked with a range of stakeholders and partners. She has also held positions at the Minnesota Land Trust, Minnesota Department of Natural Resources, and the Wisconsin Department of Natural Resources. Maggie has a BS in Conservation from University of Wisconsin - River Falls and a MA in Natural Resources and Environmental Education from Hamline University. Maggie has extensive experience in grant management and leading the development and implementation of programs.

Organization: U of MN - Water Resources Center

Organization Description:

The University of Minnesota's Water Resources Center provides leadership in freshwater management through cutting-edge research, educational opportunities for students and professionals, and community outreach. Authorized by

Congress as one of the nation's 54 water resources research institutes, the Water Resources Center connects the research expertise at the University to research problems at the national level, and advances the science of clean water for all Minnesotans through innovation, workforce development and knowledge exchange.

Budget Summary

Category / Name	Subcategory or Type	Description	Purpose	Gen. Ineligible	% Benefits	# FTE	Classified Staff?	\$ Amount
Personnel								
Undergraduate Student		Stormwater Intern will assist with collection and processing of street sweeping samples, preparation for workshops and meetings, processing sampling program applications, training and outreach materials, video creation, and other tasks to meet goals.			0%	0.75		\$53,664
Sarah Hobbie		Regents Professor and Distinguished McKnight University Professor			37.1%	0.06		\$14,372
Graduate Student		Research Assistant			25.1%	0.75		\$80,249
Maggie Karschnia		PI / Project management, supervision of staff, synthesis, outreach and reporting			37.1%	0.3		\$37,919
Jacques Finlay		Professor of Ecology, Evolution and Behavior			37.1%	0.06		\$11,601
							Sub Total	\$197,805
Contracts and Services								
Stormwater Consulting Firm (TBD)	Professional or Technical Service Contract	Stormwater Consultant: Services to work with ten cities to create ten enhanced street sweeping plans and to work with three cities and their local partners to explore new materials reuse options and to develop individual materials reuse plans for each				0.4		\$99,840
Contract Laboratories (TBD)	Professional or Technical Service Contract	Processing and testing of 112 street sweeping material samples for pollutants including PAHs, metals, GRO, DRO, pesticides, microplastics, nutrients and particle size distribution.				0.1		\$75,823
							Sub Total	\$175,663
Equipment, Tools, and Supplies								
	Tools and Supplies	Supplies such as DI water cartridges, plastic containers, ziploc bags, acid for acid-washing glassware, etc.	Supplies that will be necessary for collecting and processing street sweeping materials samples.					\$3,939

							Sub Total	\$3,939
Capital Expenditures								
							Sub Total	-
Acquisitions and Stewardship								
							Sub Total	-
Travel In Minnesota								
	Miles/ Meals/ Lodging	Car rental from U of M Fleet Services for an estimated 40 one-day trips @ \$65 per day, 100 miles roundtrip on average @ \$0.20 per mile = \$3,400.	Travel for Activity #1: Collecting street sweeping materials and stockpile samples from participating cities					\$3,400
	Miles/ Meals/ Lodging	Car rental from U of M Fleet Services for 5 trips for 1 day/trip @ \$65 per day, 100 miles roundtrip on average @ \$0.20 per mile = \$425.	Travel for Activity #2: costs to travel to cities for site visits in order to develop street sweeping plans					\$425
	Miles/ Meals/ Lodging	Lodging for 2 individuals per event @ \$165/night x 1 nights x 2 events = \$660. Lodging for 1 individuals per event @ \$165/night x 1 nights x 1 events = \$165. Meal costs for 2 individuals @ \$35 per day x 3 travel days/event x 2 events = \$350. Car rental from U of M Fleet Services for 8 trips for 1.5 days/trip @ \$65 per day, 200 miles roundtrip on average @ \$0.20 per mile = \$1,100..	Travel for Activity #3: costs for travel to facilitate county/regional discussions across the state to explore cost-effective sorting, storage, and reuse options					\$2,275
	Miles/ Meals/ Lodging	Lodging for 2 individuals per event @ \$165/night x 1 nights x 4 events = \$1,320. Meal costs for 2 individuals @ \$35 per day x 4 events x 2 days each = \$560. Car rental from U of M Fleet Services for 10 trips for 1-3 days/trip @ \$65 per day, 250 miles roundtrip on average @ \$0.20 per mile = \$1,335.	Travel for Activity #4: costs to travel to and deliver 10 workshops across the state					\$3,215
							Sub Total	\$9,315
Travel Outside Minnesota								
							Sub Total	-
Printing and Publication								

	Printing	Workshop & meeting materials: estimated 20 printed pages per participant x \$.65 per page x 30 participants per event x 15 events (10 workshops + 5 coordination meetings) and 450 folders x \$0.95 each	Printed materials for participants at workshops and coordination meetings					\$6,278
	Publication	Publication of one open access peer-reviewed journal article	Publication of an open access peer-reviewed journal article will allow results from the street sweeping materials testing to be accessible to a broad community interested in reducing nonpoint source pollution in stormwater and/or management of street sweeping materials.					\$5,000
							Sub Total	\$11,278
Other Expenses								
							Sub Total	-
							Grand Total	\$398,000

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
State				
			State Sub Total	-
Non-State				
			Non State Sub Total	-
			Funds Total	-

Total Project Cost: \$398,000

This amount accurately reflects total project cost?

Yes

Attachments

Required Attachments

Visual Component

File: [7add8ec4-713.pdf](#)

Alternate Text for Visual Component

The graphic illustrates the many sources of pollution found in stormwater and how storm drains often flow directly to waterways. Why wait for pollutants to reach waterways and do damage when targeted street sweeping can prevent a significant amount of it from entering in the first place?...

Supplemental Attachments

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

Title	File
Letter of Support from the City of Roseville	b1ff3795-9b4.pdf
Letter of Support from the City of St Cloud	b580626d-9a7.pdf
Letter of Support from the City of Duluth	88d3308d-1f0.pdf
University of Minnesota Support Letter	b3c54469-8e2.pdf

Administrative Use

Does your project include restoration or acquisition of land rights?

No

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:

N/A