Environment and Natural Resources Trust Fund
2009 Phase 2 Request for Proposals (RFP)

LCCMR ID: 053-B1

Project Title: Reducing Lawn Pollution through Targeted Homeowner Education

Total Project Budget: $ $185,672

Proposed Project Time Period for the Funding Requested: 2 years, starting July 2009

Other Non-State Funds: $ $41,175.00

Priority: B1. Reduce Soil Erosion

First Name: Lawrence **Last Name:** Baker

Sponsoring Organization: U of M

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Region: Metro

County Name:

City / Township:

Summary: We will develop approaches toTARGET lawns vulnerable to high nutrient and sediment loading and TAILOR homeowner lawn management education, to make them more effective and predictable for TMDL load reductions.

Main Proposal: 0908-2-026-proposal-Baker-U of M lawn pollution.doc

Project Budget: 0908-2-026-budget-Baker LCCMR budget form.xls

Qualifications: 0908-2-026-qualifications-Baker-U of M lawn pollution.doc

Map:

Letter of Resolution: 0908-2-026-resolution-LCCMR Grant Proposal Baker.pdf

MAIN PROPOSAL

PROJECT TITLE: REDUCING LAWN POLLUTION BY IMPROVED HOMEOWNER EDUCATION PROGRAM.

I. PROJECT STATEMENT

The problem: Urban storm water management has been identified as one of the most pressing needs of Minnesota's cities and watershed districts. Until now, the core components of most urban stormwater programs are structural best management practices (BMPs). Unfortunately, structural best management practices (such as stormwater ponds) are expensive to build and operate; they are not very efficient (ponds are especially poor at removing soluble P); and costs are borne by the public, rather than the polluter. Because of these limitations, there is a growing awareness of the need to *prevent* stormwater pollution, rather than treat it at the end of the pipe.

Improved lawn management could be an excellent way to prevent nutrient and sediment pollution in residential areas. Lawns are often a major source of nutrients and sediments to storm sewers in residential watersheds. In some cases, nutrient and sediment levels in lawn runoff are comparable with runoff from cropland, on a per-acre basis. Most of the P in lawn runoff is in the soluble form, which isn't removed to a high degree in stormwater ponds. Homeowner lawn education has the potential to cause large reductions in nutrient and sediment loadings to storm sewers, but have three limitations: (1) they are not targeted; (2) they are "one-size-fits-all" programs; and (3) their impact has not been quantified.

Solution: Our proposal seeks to greatly improve homeowner lawn education programs in three ways. First, our study would develop a way to ***target*** lawn education programs to homeowners living on the types of landscapes that are vulnerable to inappropriate lawn management practices. Second, we would develop ***tailored*** management recommendations for specific type of homeowners ("perfectionist", "casual", etc.). Third, we would develop an approach to ***quantify the effects*** of changes in lawn management. This would be valuable to watershed districts, municipalities, and other LGUs who will be required to quantify "load reduction" into their TMDL programs for impaired waters. The Mississippi Watershed Management Organization (MWMO) is our partner in this project.

II. DESCRIPTION OF PROJECT RESULTS

Result 1: Development of WATER-LAWN model Budget: $ 45,646

Deliverable 1: Report on model predictions. Completion Date: Dec. 2010

We will refine a runoff model (WATER) developed by co-PI Bruce Wilson to include nutrients; calibrated and verified with data from a long-term lawn experimental study being conducted by co-PI Brian Horgan. The model will be used to develop predictions for load reductions based on changes in lawn management in various settings.

Result 2: Homeowner survey. Budget: $ 96,507

Deliverable 1. Interpretive report on lawn management behavior.
Completion date: July 2009

Result 2 will be results from a social survey (1000 returns) to learn about lawn management behaviors and underlying motivations, to learn how education measures can be more effective. Dr. Dave Fulton, and environmental psychologist, will lead the survey component.

Result 3: GIS targeting of vulnerable landscapes Budget: $ 17,925

Deliverable 1: GIS map of areas within the MRWMO watershed that are vulnerable to nutrient and sediment from lawns. Completion date: July 2010.

Result 3 will be based on GIS mapping of vulnerable landscapes within the MWMO to target landscapes for delivery of refined lawn management education.

Result 4: Lawn homeowner education Budget: $ 25,594

Deliverable 1: Manual "Tailored lawn management for homeowners". Completion date: June 2010.

This manual will be based on results 1-3, developed in collaboration with the MWMO's education and outreach specialists. The manual will be web-based, for access by education and outreach specialists throughout the state.

III. PROJECT STRATEGY AND TIMELINE

A. Project Partners

Our partner is the Mississippi Watershed Management Organization (MWMO). They will participate heavily in the development of the tailored homeowner education program, working in collaboration with U of M outreach staff (esp. the U of M's Brian Horgan, who has an Extension appointment). The in-kind contribution from the MWMO is $15,000 (letter attached)

B. Project Impact

The proposed project will create an important tool to make homeowner lawn education efforts much more effective and more quantifiable. The latter is essential because stormwater programs in Minnesota will soon need to demonstrate "load reductions" achieved by BMPs. The outcomes will be accessible to ALL cities in Minnesota.

C. Time.

We are requesting LCCMR funding for one post-doc (0.8 FTE)), one research assistant (1.0 FTE), 0.17 FTE for PI salary, and a small amount of funding for undergraduate help. Contributed time include 5% salaries for three PIs, plus XXX from the MRWMO.

D. Long-Term Strategy

We plan to follow up this project with a on-the-ground demonstration project in a residential watershed within the MWMO using the tools developed in this project. The follow-up project will include extensive monitoring to evaluate the idea that a homeowner lawn education program can actually measurably improve water quality. This type of evaluation has not been done previously. However, it is needed if homeowner lawn education programs will be allowed to claim credit for TMDL load reductions.

Project Budget - Baker, U of M Lawn Project

IV. TOTAL PROJECT REQUEST BUDGET

BUDGET ITEM	AMOUNT	% FTE
Personnel: Personnel. Amounts are salary only; fringe is listed as a separate item.		
Larry Baker (PI), overall project management, plus work on all four results. 8% per year for 2 years.	$ 17,458	8%
Post-doc research associate - development of WATER-LAWN model code and development of scenario predictions. FTE is average over 2 years	$ 40,600	45%
Editor- to assist with development of "Manual for homeowner lawn management education" FTE is year 2 only	$ 15,000	25%
Graduate research assistant - to develop, implement, and analyze homeowner lawn management survey. 1/2 time over two years.	$ 36,000	50%
Undergrad research assistants - to help with survey tasks. In year 1 only.	$ 2,700	13%
Fringe benefits (32.4% for postdoc; 7.44 for Baker, 32.7 CS, 7.44% for undergraduate; 21.9% for RA+tuition	$ 49,922	
Contracts:	$ -	
Private firm (TBD)- for data entry of survey results	$ 4,800	
Illustrator (TBD- for education manual)	$ 1,000	
Envelopes, printing, postage for surveys	$ 13,106	
Incentives for survey participants (small monetary incentive - this actually lowers cost by increasing response rate)	$ 2,586	
Other- conference registration for MN waters (2, to present findings from project), journal publication (to add credibility to findings, for legal	$ 2,500	
TOTAL PROJECT BUDGET REQUEST TO LCCMR	**$ 185,672**	

V. OTHER FUNDS

SOURCE OF FUNDS	AMOUNT	Status
Remaining $ From Previous Trust Fund Appropriation (if applicable):	$ -	
Other Non-State $ Being Leveraged During Project Period: *What additional non-state cash $ will be spent on the project during the funding period? For each individual sum, list out the source of the funds, the amount, and indicate whether the funds are secured or pending approval.*	$ -	
Other State $ Being Spent During Project Period:	$ -	
University of Minnesota indirect costs, calculated at 51%		*Secured*
In-kind Services During Project Period: Two items below	$ -	
Faculty salaries for U of M professors B. Horgan and B. Wilson (5% per year; value includes fringe benefits). Wilson will lead the modeling task;Horgan will lead the development of the educational manual.	$ 26,175	Secured
The Mississippi Watershed Management Organization will be our collaborator. Their tasks will be to assist with identifying vulnerable landscapes and to help design the homeonwer education program (including the manual). Letter of commitment included in proposal package.	$ 15,000	Secured
Past Spending: *List money spent or to be spent on this specific project, cash and/or in-kind, for 2-year timeframe prior to July 1, 2009*	$ -	
Total Other Funds (non-LCCMR)	**$ 41,175**	

PROJECT MANAGER QUALIFICATIONS: DR. LARRY BAKER

Dr. Baker is a Senior Fellow in the Minnesota Water Resources Center. Dr. Baker has managed or co-managed about 25 research projects over the past 20 years. A hallmark of his research is the development of multidisciplinary teams to seek solutions to environmental problems. He has authored or coauthored more than 100 technical papers and two major environmental assessment reports. His latest edited book, *The Water Environment of Cities*, will be published in early 2009. He has taught the Water Policy course at the University of Minnesota for the past six years, and previously taught an array of environmental engineering courses while on the faculty of the Civil and Environmental Engineering Department at Arizona State University.

With regard to the proposed project, Dr. Baker was the lead author of three chapters in the Water Resources Center's on-line manual *Assessment of Stormwater Best Management Practices*, including the Source Reduction chapter. Ideas developed in this proposal have also been published by the PI in Storm Water Magazine and in a peer-reviewed journal article.

In his private life, he is also chairman of the board of Friends of the Sunrise River (Chisago County) and has been very active in the Citizens League and is a member of the CLs Water Policy Study Committee (ongoing).

In the past few years he has greatly expanded his public engagement efforts, making frequent presentations to watershed districts, professional groups and citizen groups, in addition to scientific audiences. He has also written numerous articles for the *Minnesota Star and Tribune*, *Minnesota Journal*, and several professional magazines.

The University of Minnesota's Water Resource Center
The WRC is the main water-related outreach center of the University of Minnesota. The proposed products of the proposed LCCMR project (watershed P balance spreadsheet and users manual) will be posted on the WRC website.