

**Environment and Natural Resources Trust Fund
2011-2012 Request for Proposals (RFP)**

Subd: 03o

Project Title: Measuring Conservation Practice Outcomes

Category: C3+4. Technical Assistance and Community-Based Planning

Total Project Budget: \$ 340,000

Proposed Project Time Period for the Funding Requested: 2 yrs, July 2011 - June 2013

Other Non-State Funds (secured): \$ 0

Summary:

A 3-tiered approach to improve measurement of the environmental benefits of conservation practices: improve existing and develop new pollution estimators, verify field estimators, and local government unit training and education.

Name: Megan Lennon

Sponsoring Organization: Board of Water and Soil Resources

Address: 520 Lafayette Rd N

Saint Paul MN 55155

Telephone Number: 651-296-1285

Email: megan.lennon@state.mn.us

Web Ad:

Location:

Region: Statewide

Ecological Section: Statewide

County Name: Statewide

City / Township:

2011-2012 MAIN PROPOSAL

PROJECT TITLE: Measuring conservation outcomes with new and revised estimators

I. PROJECT STATEMENT

This proposal seeks additional funds to further improve, refine existing and create new estimators to quantify environmental benefits from conservation programs through a continued partnership with researchers at the University of Minnesota's Department of Soil, Water and Climate.

We propose a three tiered approach to improve estimates of conservation projects implemented by BWSR and cooperating agencies: 1) Improvement of existing pollution reduction estimators and creation of new estimators where needed, 2) Field verification and ground truthing for revised and new pollution reduction estimators and 3) Local Government Unit (LGU) training and education. Accounting for actual outcomes and measureable environmental benefits to the quality of soil, water, and habitat is an essential component of implementing conservation projects. BWSR currently utilizes eLINK, an online reporting system and database, to quantify the pollution reduction benefits of installed Best Management Practices (BMPs) by using models or 'estimators'. Estimators quantify the outcomes of conservation practices in terms of reduced soil erosion, sediment and phosphorus reduction, carbon sequestered, etc. The demands on the reporting system to estimate and quantify environmental benefits of conservation practices have outpaced BWSR's ability to provide such information. For example, the pollution reduction benefits of some BMPs are not included in the eLINK database because Local Government Units do not have access to an estimator or model that quantifies the outcomes of implementation.

In the past, BWSR has worked closely with the University of Minnesota to develop the first generation of estimators to quantify pollution reduction benefits of conservation practices. BWSR will be utilizing \$100,000 from the Clean Water Fund and significant staff time on a partnership with the University of Minnesota to begin a new phase of research aimed at improving and verifying estimation of environmental benefits of conservation practices. The above-mentioned project will precede the LCCMR proposed activities.

II. DESCRIPTION OF PROJECT ACTIVITIES

Activity 1: Develop new and improve existing pollution estimators **Budget:** \$ 90,000

Create a work team composed of BWSR staff and University of Minnesota researchers. The work team will identify BMPs requiring new estimator development and those requiring revision of current estimators. The team will work collaboratively to generate new estimators (e.g. infiltration, flood control – water retention, septic system improvement), improve current estimators (e.g. erosion reduction and carbon sequestration), and launch the new estimators in eLINK.

| Outcome | Completion Date |
|---|------------------------|
| 1. Produce new pollution reduction estimators for eLINK | June 30, 2013 |
| 2. Revise existing pollution reduction estimators for eLINK | June 30, 2013 |
| 3. Deploy new estimators in eLINK | June 30, 2013 |

Activity 2: Field verification **Budget:** \$ 196,000 (total including BWSR contribution \$296,000)

Validate newly developed and revised pollution reduction estimators for BMPs by conducting fieldwork and collecting samples on implemented BMP sites. Analyze data collected, and compare to estimate derived from newly created estimator, and calibrate estimator. (BWSR will provide \$100,000 after 7/1/2010 to initiate the pilot study).

| Outcome | Completion Date |
|----------------------------------|------------------------|
| 1. Verify new/revised estimators | June 30, 2013 |

Activity 3: LGU Training and education Budget: \$ 50,000

Training for LGUs and other eLINK users on the newly revised and developed pollution reduction estimators. Development of training content in alternative formats (i.e. video) that is widely accessible. Quality assurance and quality control assessment of LGU-reported pollution reduction values verifying the training was successful and LGUs are using the estimators correctly. Adjustments to estimation and reporting procedures following quality assurance and quality control review.

| Outcome | Completion Date |
|---|------------------------|
| 1. Training sessions for LGUs | June 30, 2013 |
| 2. QA/QC and verification of proper estimator usage | June 30, 2013 |

Activity 4: Estimate land-applied Endocrine Disrupting Compound (EDC) Budget: \$4,000

Directly measure land-applied EDC in soil samples. Develop particle-water partition coefficients for the most commonly used EDC. Estimate the quantity of EDC that are retained on the land by adoption of conservation practices.

| Outcome | Completion Date |
|---|------------------------|
| 1. Develop estimates of 1 ECD (atrazine) in Minnesota soil and water, 1 soil type. With a limited budget allowing analysis of only one EDC, atrazine was chosen because it is the most widely-used, land-applied EDC. | June 30, 2013 |
| 2. Comprehensive literature review of land-applied EDCs | June 30, 2013 |

III. PROJECT STRATEGY

A. Project Team/Partners

The project team includes Ed Nater, Cinzia Fissore (paid), Brent Dalzell (paid) and a graduate student (paid) from the University of Minnesota's Department of Soil, Water and Climate, and Julie Blackburn, Greg Larson (paid) and Megan Lennon (paid) from BWSR. Project partners from the University of Minnesota will conduct field research and collect and analyze data necessary for revision and development of new models to estimate environmental benefits of conservation practices. Megan Lennon is the project manager, and Greg Larson will consult with University partners regarding research, and conduct training for local governments units on new and revised pollution reduction estimators.

B. Timeline Requirements

BWSR funded assessment and fieldwork will begin 7/1/2010. Fieldwork and data collection will continue July 1, 2011 and proceed through summer 2012. Data analysis, estimator revision and creation will begin as soon as data is available and proceed through June 30, 2013. Field verification will begin summer 2011. The training component will be planned for early 2013.

C. Long-Term Strategy and Future Funding Needs

The activities included in this proposal are critical to measuring the environmental outcomes and determining the effectiveness of conservation practices in Minnesota. BWSR's ongoing work with conservation programs necessitates assessments of practice effectiveness. With additional funding, this project could expand to include more comprehensive EDC research that is complimentary to both the 2010-2012 LCCMR project by Swackhammer, Koskinen and Rice and the 2011-2013 LCCMR proposal by Sadowsky. A mid-level analysis of land applied EDCs requires additional funding of \$30,000 and would provide analysis of 5 EDCs (3 phytoestrogens, atrazine, and 1 growth hormone) on 3 soil types. A full scale analysis of land-applied EDCs requires additional funding of \$88,000 and would provide analysis of 8 EDCs (atrazine, 3 phytoestrogens, 1 growth hormone, and 3 livestock antibiotics) on 8 soil types. The suite of EDCs chosen for both the mid-level and full scale analysis is identical to those in the Sadowsky and Swackhammer, Koskinen and Rice proposals. Analysis of the same suite of EDCs allows for inter-study comparability and lower analytical costs.

2011-2012 Detailed Project Budget

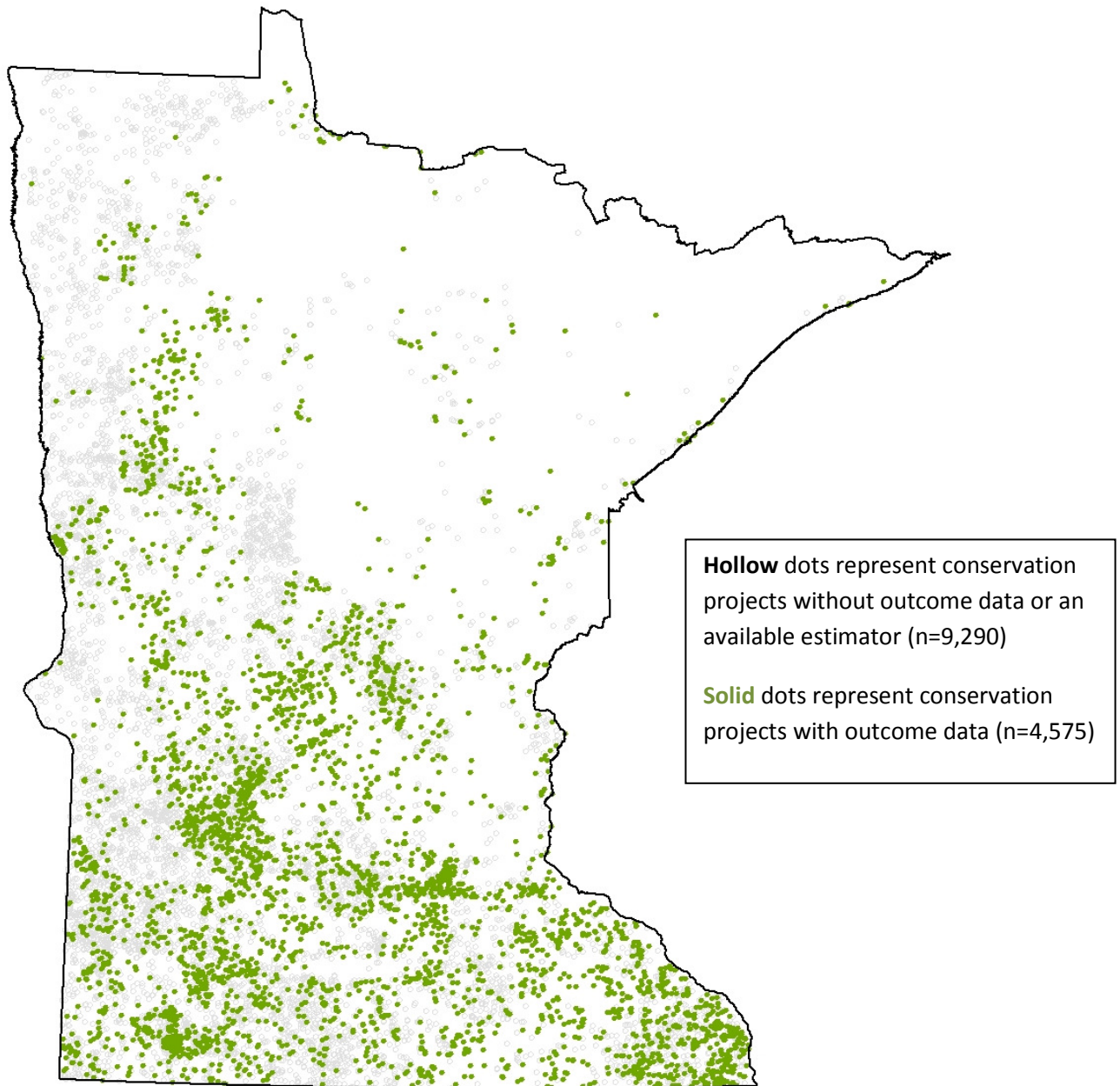
IV. TOTAL TRUST FUND REQUEST BUDGET 2 years

| <u>BUDGET ITEM</u> | <u>AMOUNT</u> |
|---|-------------------|
| Personnel: Megan Lennon, BWSR soil scientist, classified staff (currently funded with special project funds devoted to conservation outcomes. These funds end 6/30/11). 25% of time spent on this LCCMR project. 100% of funds spent on salary and fringe, 7/1/2011 - 6/30/2013. One person in this position. | \$ 35,000 |
| Personnel: Greg Larson, BWSR soil scientist, unclassified. 20% of time spent on this LCCMR project. 100% of funds spent on salary and fringe, 7/1/2011 - 6/30/2013. | \$ 20,000 |
| Contracts: Contract with University of Minnesota - Department of Soil, Water and Climate. The contract includes funds for: a graduate student to develop new 'estimators' (\$68,000 for salary, tuition & insurance); two post docs to conduct field verification research (\$127,000 for salary & insurance); undergraduates to assist with fieldwork (\$9,600 for salary); and analysis/supplies (\$20,400). | \$ 225,000 |
| Equipment/Tools/Supplies: Germanium Counter/gamma spectrometer (This item has an effective life after 6/30/2013 and will continue to be used for project related research through out its effective life.) | \$ 60,000 |
| TOTAL ENVIRONMENT & NATURAL RESOURCES TRUST FUND \$ REQUEST | \$ 340,000 |

V. OTHER FUNDS

| <u>SOURCE OF FUNDS</u> | <u>AMOUNT</u> | <u>Status</u> |
|---|---------------|---------------|
| Other Non-State \$ Being Applied to Project During Project Period: | \$ - | |
| Other State \$ Being Applied to Project During Project Period: | \$ - | |
| In-kind Services During Project Period: BWSR IT staff support for Activity 3, specifically developing training videos and making training available on the BWSR website. | \$ 35,000 | |
| Funding History: \$100,000 from BWSR budget to initiate Activity 2 prior to 2011-2012 LCCMR funds becoming available. | \$100,000 | |

Pollution Reduction Outcomes tracked by eLINK



Dots not to scale of project site.

LCCMR Proposal 2011-2012 Measuring Outcomes of Conservation Practices

Project Manager Qualification and Organization Description

Project Manager: Megan Lennon

Current Position: State Soils Specialist, Board of Water and Soil Resources

Education:

- BS: University of Minnesota – Twin Cities
Major: Environmental Science
- MS: University of Minnesota – Twin Cities
Major: Soil Science

Experience:

- MS research in carbon sequestration in Minnesota soils
- Conducted initial evaluation of ‘estimator’ needs for various BWSR conservation programs
- Instructor for ‘eLINK calculator’ training
- Co-instructor for soils component of Wetland Delineators Certification Program
- Conduct field investigations and wetland delineations as part of day to day BWSR operations

Other:

- Professional Soil Scientist In-training (#130894)

Organization Description:

The Board of Water and Soil Resources (BWSR) is a State agency.

