**PROJECT TITLE: Maintaining pollutant removal in stormwater ponds**

**I. PROJECT STATEMENT**

The goal of this proposal is to address the pressing issue: “*how long do stormwater pond remain effective at removing pollutants*?” This proposal was developed in response to findings from the recently completed ***Minnesota Stormwater Research Roadmap***. Specifically, stormwater managers surveyed throughout Minnesota identified “operations and maintenance” of stormwater the highest priority (and the most urgent) research need. Addressing this question falls under LCCMR funding priorities F and B2. The proposed project would have two benefits for cities, watershed districts, and other entities who manage stormwater. First, it would provide a simple method to estimate the lifetime of effective pond life before dredging is required; and second, it would guide source reduction approaches to reduce inputs of sediments and coarse organic material from the watershed.

To accomplish this, we propose developing a simple statistical tool to predict the rate of pond filling in relation to watershed characteristics. To do this we will collect multiple cores sediment cores to determine pond-wide sediment accumulation rates for about 20 ponds and compare pond sediment accumulation rates with watershed characteristics of each pond. Ponds to be studied will be carefully selected to represent a range of watershed characteristics. We will then simple statistical tool to relate watershed characteristics to pond filing rates. Cities and their consultants could then use this statistical tool to estimate the effective lifetime of each of their stormwater ponds and point to ways to extend these lifetimes using upstream source reduction (such as enhanced street sweeping or improved erosion control).

**II. PROJECT ACTIVITIES AND OUTCOMES**

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| **Activity 1 Title: Pond coring study**  **Description:** *We will select about 20 stormwater ponds for analysis, based on both pond and watershed characteristics to represent a range of urban conditions. We will leverage this effort using a previously developed inventory of 30,000 stormwater ponds located throughout the state, developed by the U of M in a previous Clean Water Fund project.* |  |

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| *We will collect up to 10 cores per pond to determine overall sedimentation rate (inches/yr, pounds/acre). In addition to sediment accumulation, we will also measure phosphorus accumulation in sediments, allowing improved estimates of removal rates of these nutrients. Watershed characteristics will be determined from a statewide land cover GIS data and a statewide LiDAR (topographic) database. Lake coring will occur over two winters.*  **ENRTF BUDGET: $ 212,520** |  |

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| **Outcome** | **Completion Date** |
| *1. Pond coring database* | *May 2022* |
| *2. Watershed characteristics database* | *May 2022* |

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| **Activity 2 Title: Development of user manual for cities.**  **Description:** *Data collected in activity 1 will be analyzed using multiple regression analysis to develop one or more final equations to relate watershed characteristics to pond filling rates and phosphorus retention rates. We will also analyze watersheds to determine how production of solids (coarse and fine) could be reduced, for example, by better erosion control and/or enhanced street sweeping. This analysis will be incorporated into a* ***User Manual for Managing Stormwater Pond Life****.*  **ENRTF BUDGET: $ 94,163** |  |

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| **Outcome** | **Completion Date** |
| *1.User manual for managing stormwater pond life* | *June 2023* |
| *2. Presentation at the Minnesota Water Resources Conference* |  |

**III. PROJECT PARTNERS AND COLLABORATORS:** *We will work with a number of cities to obtain additional data about their stormwater ponds to develop our final pond dataset but do not envision fiduciary relationships.*

**IV. LONG-TERM IMPLEMENTATION AND FUNDING:** *This is a one-time project that we believe will create a valuable tool by the end of the project, with no follow-ons.*

**V. SEE ADDITIONAL PROPOSAL COMPONENTS:**

**A. Proposal Budget Spreadsheet - uploaded**

**B. Visual Component or Map - Attached**

**C. Parcel List Spreadsheet - NA**

**D. Acquisition, Easements, and Restoration Requirements - NA**

**E. Research Addendum (Not required at proposal submission stage. Required later in process, if proposal is recommended. Staff will provide further information at that time)**

**F. Project Manager Qualifications and Organization Description- Attached**

**G. Letter or Resolution - NA**

**H. Financial Capacity -**