**PROJECT TITLE: Assessing the Value of Green Infrastructure within Minnesota’s Water Infrastructure Funding Shortfall**

**I. PROJECT STATEMENT**

We propose a state-wide study of the potential role of green infrastructure — the economic value of services provided by natural systems — in addressing Minnesota’s estimated $7.5 billion water infrastructure gap.

Minnesota faces a water infrastructure financing challenge. The EPA estimates that maintaining the state’s wastewater and drinking water infrastructure will cost $7.5 billion over the next 20 years. Loan requests to the state’s Drinking Water Revolving Fund and Clean Water State Revolving Fund have recently exceeded their capacity by 7 and 3 times, respectively. Since local water utilities rely substantially on revenues from ratepayers, changing state demographics also raise serious affordability concerns, especially in rural parts of the state that are losing population.

What these cost estimates omit, however, are the economic value of services provided by natural systems: the “green” complement to traditional “gray” infrastructure. In both rural and urban settings, green infrastructure can mitigate the intensity and frequency of excess storm water flows, enhance groundwater recharge for drinking water supply, and reduce water treatment burden by filtering contaminants through the soil column. Preserving, protecting, and enhancing Minnesota’s natural systems could thus play a substantial role in meeting water infrastructure financing shortfalls, as well as buffering local communities against weather extremes. However, fundamental data on these ecosystem services are missing. Answers to basic questions like what, where, and how much green infrastructure can contribute are needed. Such answers are most useful at a scale that front-line decision-makers can use at the city, township, county and special district levels.

We propose a state-wide study of the potential role of green infrastructure in addressing Minnesota’s water infrastructure gap. We aim to assess the infrastructure need and local funding capacity of each of the state’s 6,787 community water systems. In addition to providing cost comparisons for traditional and nature-based wastewater and drinking water infrastructure as well as co-benefits of these systems, we will identify different financing solutions for these investments and assessments of the local implications of different funding strategies.

**II. PROJECT ACTIVITIES AND OUTCOMES**

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| **Activity 1 Title:** Water infrastructure assessment **Description:**Statewide assessments of waste water and drinking water infrastructure investment need and local revenue raising capacity. Under the leadership of Dr. Jerry Zhao and the Institute for Urban & Regional Infrastructure Finance, we will assess and map water infrastructure needs for each community water system statewide. To assess needs for green and grey water infrastructure investment, we will add to the dataset information on tax base and other local revenue sources, and compare projected costs with available resources.**ENRTF BUDGET: $ 141,450** |  |

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| **Outcome** | **Completion Date** |
| *1. Map and dataset of estimated water gray infrastructure costs out to 2070 for state’s 6,787 community water systems.*  | *July 2021* |
| *2. Corresponding map and data of revenue raising capacity from own sources (ratepayers, property tax, storm water fees, etc.)* | *December 2022* |
| *3. Report on sources of additional water infrastructure demand outside of maintenance costs assumed in above, and implications for costs* | *July 2021* |

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| **Activity 2 Title:** Green infrastructure potential to address water quality and quantity and deliver co-benefits**Description:**There is a growing awareness of the benefits of “green infrastructure” in the form of perennial cover, riparian buffers, and restored wetlands to improve water quality, enhance groundwater recharge, reduce flooding, and deliver other valuable ecosystem services, including habitat for wildlife. Building off ten years of work at the Natural Capital Project and research on the economic and biodiversity benefits of nature, we will assess the potential for green infrastructure to address water quality and quantity management requirements and deliver valuable co-benefits.**ENRTF BUDGET: $ 169,504** |  |

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| **Outcome** | **Completion Date** |
| *1. Maps and geographic information system data showing viable locations for nature-based infrastructure strategies and associated water treatment and quantity management savings to community water systems.* | *July 2022* |
| *2. Extension of and integration with existing decision-support tools for parcel acquisition to show estimated potential water infrastructure savings.* | *July 2022* |
| *3. Informational and educational materials highlighting green infrastructure cost savings tailored to local governments involved in “One Watershed, One Plan” collaborations.* | *June 2023* |

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| **Activity 3 Title:** Financing local solutions**Description:**We anticipate persistent funding gaps between local resources to protect water quality and needs of communities. In this activity, we will identify alternative revenue streams or innovative financing mechanisms to address identified revenue gaps for critical water infrastructure (green and grey). **ENRTF BUDGET: $ 73,969** |  |

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| **Outcome** | **Completion Date** |
| *1. Report summarizing alternative financial instruments for green and gray infrastructure development – e.g. federal funding sources, public-private partnerships, & green bonds* | *June 2023* |
| *2. Forecasts to 2070 of local fiscal impacts of example financing strategies and customized reports to One Watershed One Plan groups on available financing mechanisms to promote water quality and other ecosystem services.* | *June 2023* |

**III. PROJECT PARTNERS AND COLLABORATORS:**

The project will be co-led by Dr. Bonnie Keeler and Dr. Jerry Zhao (faculty at the Humphrey School of Public Affairs at the University of Minnesota) and managed by current Ph.D. student Terin Mayer. Work will be conducted in collaboration with One Watershed One Plan partners and the Department of Health.

**IV. LONG-TERM IMPLEMENTATION AND FUNDING:**

This project is a stand-alone effort and not part of a longer-term funding request. It builds on previous work on the value of water-related ecosystem services and estimated costs of drinking water treatment and source water protection. All data generated as part of the project will be shared with agency partners and made publicly available through reports hosted online.