REQUEST FOR PROPOSALS (RFP)

Optimizing Nature-based Solutions at the Watershed Scale Using Real-time Sensing and Controls (5304)

Date Posted
Friday, September 20, 2024

Due Date
Proposals must be received by 3:00 pm Mountain Time on Thursday, November 21, 2024

WRF Project Contact
Alice Jariz, PE, ajariz@waterrf.org

Project Sponsors
This project is funded by The Water Research Foundation (WRF) as part of WRF's Research Priority Program.

Project Objectives
- Determine the placement of sensors and controls at the watershed/sewershed scale to optimize the performance of nature-based solutions (NbS)
- Optimize NbS implementation for cost efficiency, contaminant pulses, and flow modulation
- Determine the feasibility of matching contaminant peaks with infiltration-based measures for enhanced performance

Budget
Applicants may request up to $300,000 in WRF funds for this project.

Background and Project Rationale
Natural treatment systems and green stormwater infrastructure hold promise for improving water quality and managing flows while delivering other benefits appreciated by communities. Performance of these systems could be enhanced by recent advances in wireless sensors, real-time controls, and data science (i.e., machine learning, digital twins, and other advanced algorithms). For example, real-time control and sensing could help water managers divert flows into natural treatment systems by switching them on or off in response to contaminant pulses or anticipated weather conditions. Low-cost sensors developed over the past decade should allow for more precise targeting of nutrient pollution (i.e., nitrate) to address persistent non-point source water quality challenges. This can help municipalities meet water quality goals set by watershed management plans or better regulate stormwater and wet weather flows to mitigate flooding and reduce pollutant loads without having to invest in additional centralized

water management systems. In addition, monitoring and real-time sensing could help municipalities and states track their progress toward meeting more stringent regulatory requirements (e.g., Total Maximum Daily Loads [TMDLs]), signal the need for maintenance of distributed assets, and indicate when a nature-based system needs to be refurbished or decommissioned.

New digital tools (i.e., sensors and computational algorithms, including machine learning) can greatly enhance the ability of engineers to design, plan for, and maintain complex and/or distributed treatment systems. These tools unlock our ability to collect and interpret datasets with increased temporal and spatial resolution. By pairing these new tools with NbS in pilot or demonstration scale systems, utility managers and engineers can gain confidence in decisions that incorporate NbS and more successfully capitalize on their multiple benefits.

This proposed project will benefit WRF's subscribers by advancing the optimization of sensor networks (including placement and control schemes) and sensing techniques for NbS. This will improve the ability of WRF subscribers to incorporate NbS into their watershed management plans. Furthermore, it will improve data analytics, real-time monitoring, and watershed-scale modeling to help utilities with real-world applications to achieve their holistic water management goals.

Research Approach
The research approach for this project is intentionally flexible to allow for innovation from proposers. Proposers should describe how they will conduct the research to meet the objectives above. The research approach could include:

- Conducting a comprehensive literature review
- Conducting a survey and synthesizing available case studies from utilities and municipalities
- Piloting the real-time sensing networks in one selected municipal location that can get assistance from the city/watershed/water management district
- Organizing a utility-focused virtual workshop for peer-to-peer information exchange
- Preparing a utility-facing guidance document

Expected Deliverables
Possible deliverables could include:

- Literature review synthesis document
- Summary of survey results
- Utility virtual workshop
- Utility-facing guidance document, including application case studies and pilot testing results
- Webcasts and conference presentations

Communication Plan
Please review WRF's *Project Deliverable Guidelines* for information on preparing a communication plan. Conference presentations, webcasts, peer-reviewed publication submissions, and other forms of project information dissemination are typically encouraged.

Project Duration
The anticipated period of performance for this project is 24-36 months from the contract start date.

Proposal Evaluation Criteria
The following criteria will be used to evaluate proposals:

- Understanding the Problem and Responsiveness to RFP (maximum 20 points)
- Technical and Scientific Merit (maximum 30 points)
- Qualifications, Capabilities, and Management (maximum 15 points)
- Communication Plan, Deliverables, and Applicability (maximum 20 points)
- Budget and Schedule (maximum 15 points)

PROPOSAL PREPARATION INSTRUCTIONS

Proposals submitted in response to this RFP must be prepared in accordance with WRF's *Guidelines for Research Priority Program Proposals* and *Instructions for Budget Preparation*. These guidelines contain instructions for the technical aspects, financial statements, indirect costs, and administrative requirements that the applicant must follow when preparing a proposal.

Proposals that include the production of web- or software-based tools, such as websites, Excel spreadsheets, Access databases, etc., must follow the criteria outlined for web tools presented in the *Technology Deliverables Guidance*.

Eligibility to Submit Proposals
Proposals will be accepted from both U.S.-based and non-U.S.-based entities, including educational institutions, research organizations, governmental agencies, and consultants or other for-profit entities.

WRF's Board of Directors has established a *Timeliness Policy* that addresses researcher adherence to the project schedule. Researchers who are late on any ongoing WRF-sponsored studies without approved no-cost extensions are not eligible to be named participants in any proposals. Direct any questions about eligibility to the WRF project contact listed at the top of this RFP.

Administrative, Cost, and Audit Standards
WRF's research program standards for administrative, cost, and audit compliance are based upon, and comply with, Office of Management and Budget (OMB) Uniform Grants Guidance (UGG), 2 CFR Part 200 Uniform Administrative Requirements, Cost Principles, and Audit Requirements for Federal Awards, and 48 CFR 31.2 Contracts with Commercial Organizations. These standards are referenced in WRF's *Guidelines for Research Priority Program Proposals* and include specific guidelines outlining the requirements for indirect cost negotiation agreements, financial statements, and the Statement of Direct Labor, Fringe Benefits, and General Overhead. Inclusion of indirect costs must be substantiated by a negotiated agreement or appropriate Statement of Direct Labor, Fringe Benefits, and General Overhead. Well in advance of preparing the proposal, your research and financial staff should review the detailed instructions included in WRF's *Guidelines for Research Priority Program Proposals* and consult the *Instructions for Budget Preparation*.

Budget and Funding Information
The maximum funding available from WRF for this project is $300,000. The applicant must contribute additional resources equivalent to at least 33% of the project award. For example, if an applicant requests $100,000 from WRF, an additional $33,000 or more must be contributed by the applicant. Acceptable forms of applicant contribution include cost share, applicant in-kind, or third-party in-kind that comply with 2 CFR Part 200.306 cost sharing or matching. The applicant may elect to contribute more than 33% to the project, but the maximum WRF funding available remains fixed at $300,000. Proposals that do not meet the minimum 33% of the

project award will not be accepted. Consult the *Instructions for Budget Preparation* for more information and definitions of terms.

Period of Performance
It is WRF's policy to negotiate a reasonable schedule for each research project. Once this schedule is established, WRF and its sub-recipients have a contractual obligation to adhere to the agreed-upon schedule. Under WRF's *No-Cost Extension Policy*, a project schedule cannot be extended more than nine months beyond the original contracted schedule, regardless of the number of extensions granted.

Utility and Organization Participation
WRF encourages participation from water utilities and other organizations in WRF research. Participation can occur in a variety of ways, including direct participation, in-kind contributions, or in-kind services. To facilitate their participation, WRF has provided contact information, on the last page of this RFP, of utilities and other organizations that have indicated an interest in this research. Proposers are responsible for negotiating utility and organization participation in their particular proposals. The listed utilities and organizations are under no obligation to participate, and the proposer is not obligated to include them in their particular proposal.

Application Procedure and Deadline
Proposals are accepted exclusively online in PDF format, and they must be fully submitted before 3:00 pm Mountain Time on Thursday, November 21, 2024.

The online proposal system allows submission of your documents until the date and time stated in this RFP. To avoid the risk of the system closing before you press the submit button, do not wait until the last minute to complete your submission. Submit your proposal at https://forms.waterrf.org/cbruck/rfp-5304.

Questions to clarify the intent of this RFP and WRF's administrative, cost, and financial requirements may be addressed to the WRF project contact, Alice Jariz at 303.347.6111 or ajariz@waterrf.org. Questions related to proposal submittal through the online system may be addressed to Caroline Bruck at 303.347.6118 or cbruck@waterrf.org.

Utility and Organization Participants

The following utilities have indicated interest in possible participation in this research. This information is updated within 24 business hours after a utility or an interested organization submits a volunteer form, and this RFP will be re-posted with the new information. **(Depending on your settings, you may need to click refresh on your browser to load the latest file.)**

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