THE Water Research FOUNDATION

Date Posted: Thursday, February 9, 2023

REQUEST FOR PROPOSALS (RFP)

Advanced Metering Infrastructure (AMI) Workshop: Better Use of the Systems and Data (RFP 5208)

Due Date: Proposals must be received by **3:00 pm Mountain Time on Monday, April 10, 2023**
WRF Project Contact: Dr. Jian Zhang, jzhang@waterrf.org

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

Project Objectives
This project will bring different perspectives together to understand the breadth of applications of advanced metering infrastructure (AMI) systems and to help realize maximum value from these systems.

Budget
Applicants may request up to $75,000 in WRF funds for this project.

Background and Project Rationale
Utilities across the United States have been deploying advanced metering infrastructure (AMI) systems to improve their operations. As AMI technologies are evolving rapidly and utilities are gaining experience with these systems, some utilities have started to explore alternative uses of AMI systems and are interested in comparing experiences—or at least thoughts—with other utilities that might be active in this area.

Numerous studies on AMI have been published. One example is WRF project 4741, *AMI-Meter Data Analytics*, which focuses on customer interactions, water accounting, and meter management. Another example is WRF project 4917, *Utilizing Smart Water Networks to Manage Pressure and Flow for Reduction of Water Loss and Pipe Breaks.* According to the project, a network on an AMI system can be leveraged to provide other types of data, beyond its primary purpose to record and transmit customers' water usage data. The AMI network can convey signals from other types of sensors to better inform the utility of changing conditions on the water network, e.g., using the AMI network to convey readings from pressure and water quality sensors.

With the detailed and frequent data collected from customer meters, AMI systems can serve as a backbone for other distribution system monitoring purposes, such as pressure measurement, hydraulic modeling (e.g., demand forecasting and peak demand analysis of natural resources), pipeline leak

detection, temperature measurement, water quality monitoring, cathodic protection, greenhouse gas and energy reduction monitoring, etc., potentially adding considerable value to utilities. AMI may also have the potential to offer limited operations control, including facilitated flushing, well and level monitoring, remote shutoff valves, customer shutoff meters, emergency response, and limited wastewater management tools.

To realize benefits beyond meter readings for customer billing, utilities need to understand improvement opportunities enabled by the new AMI data set and associated data processing, analysis tools, and potential control tools. Some utilities have started to explore alternative uses of AMI systems, such as developing water conservation strategies for the commercial, industrial, and institutional (CII) sector, demand forecasting that will provide real-time data to keep water costs low for customers, and tracking reductions in water consumption achieved through water conservation efforts. Utilities then calculate how those reductions translate to energy savings and greenhouse gas reductions. It's time for these utilities to come together to compare experiences, share lessons learned, and identify future opportunities with the entire water sector.

Given the need for AMI users to learn from each other and make better use of their AMI systems, this workshop is intended to capture innovative applications of AMI technology through valuable and practical discussions, plus identify any research or innovation needs that might be particularly useful in continuing to advance this area of practice.

Research Approach

This RFP is intentionally flexible in the research approach to encourage creativity and originality from proposers. Many scenarios and some approaches are listed below, but they are not intended to be restrictive and should be used as a starting point. Proposers should describe how they will conduct the research to meet the objectives listed above and deliver innovative and practical results to AMI users.

- Identify and engage individual utilities, informal water utility groups, and the like working to share AMI experiences at the local/national/industrial levels. These groups could be sought out for participation in this workshop through communication with AWWA section offices and/or other innovative outreach approaches.
- Explore, discuss, and summarize uses of AMI systems for various purposes, such as smart water system issues, emergency response, water audits and leakage management activities, wastewater management, and distribution system management.
- Explore relationships between daily temperatures, freeze-thaw cycles, and the creation of water main breakages/leaks in utility infrastructure.
- Include utilities in similar industries, such as electric utilities, oil/gas, pipelines, etc., to provide additional perspectives on AMI applications and data analytics.
- Explore, discuss, and summarize use of AMI systems and networks by customers and third party users, e.g., using the system to read submeters or other instrumentation not owned by the utility, and how this practice is paid for.
- Identify current limitations of use of AMI in the water industry and potential future growth from any technological advancements.
- Provide related case studies that will demonstrate potential additional uses for AMI.
- Identify gaps for future AMI research projects.

Expected Deliverables
A guideline for utilities with a compilation of experience and lessons learned in various applications of AMI systems, as well as a list of potential research ideas.

Communication Plan
Please review WRF's *Project Deliverable Guidelines* for information on preparing a communication plan. The guidelines are available at https://www.waterrf.org/project-report-guidelines#project-deliverable-guidelines. Conference presentations, webcasts, peer review publication submissions, and other forms of project information dissemination are typically encouraged.

Project Duration
The anticipated period of performance for this project is 12 months from the contract start date.

References and Resources
The following list includes examples of research reports, tools, and other resources that may be helpful to proposers. It is not intended to be comprehensive, nor is it a required list for consideration.

- Brueck, T., C. Williams, J. Varner, and P. Brink. 2020. *AMI-Meter Data Analytics*. Project 4741. Denver, CO: The Water Research Foundation.
- Karl, M., E. Culbertson, J. Abrera, and R. Janke 2022. *Utilizing Smart Water Networks to Manage Pressure and Flow for Reduction of Water Loss and Pipe Breaks*. Project 4917. Denver, CO: The Water Research Foundation.

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
The Emerging Opportunities Program has unique proposal requirements. Please follow the submission instructions below. Proposals not adhering to the restrictions below will not be accepted.

The entire proposal, ***excluding*** the proposal cover worksheet, resumes, budget form, budget narrative, co-funding support form (when applicable), schedule, and references, should **not exceed ten pages in length**. Proposals must include the following components.

- **Proposal Cover Worksheet:** The *Proposal Cover Worksheet* is available at https://www.waterrf.org/proposal-guidelines#RPP-proposal-coversheet
- **Background and Statement of Need:** Provide a brief summary of the current state of knowledge for the issue that the proposed research will help address, and the drivers for the proposed research.

- **Objectives:** The proposed research objectives should be clearly identified in one or two sentences.
- **Technical Approach**: Describe how the proposed research will be conducted and the tasks necessary to accomplish the objectives.
- **Benefit to WRF Subscribers:** Identify the practical benefits of the proposed research to water utilities and the water community.
- **Research Team and Other Participants:** Identify the key members of the research team and provide brief statements of their qualifications to conduct the proposed research. Identify any other organizations that have committed to collaborate on the proposed research. Curriculum vitae or resumes for research team members are required.
- **Budget:** A detailed budget is required. The researcher should identify the amount of WRF funds requested and any other cost-share, in-kind, or cash support for the proposed research. Cost-share, in-kind, and cash support is not required for submission, however, is encouraged. The following items will need to be included with the budget. *Instructions for Budget Preparation* are available at https://www.waterrf.org/proposal-guidelines#RPP-instr-budget-prep.
    - Proposal Budget Form: https://www.waterrf.org/proposal-guidelines#RPP-proposal-budget-form
    - Budget Narrative (see instructions for budget preparations)
    - Emerging Opportunities Co-Funding Support Form (when applicable): Each co-funding organization providing cash to the project payable directly to WRF must complete a separate Emerging Opportunities Co-Funding Support Form and include it with the proposal package. The form is available at https://www.waterrf.org/proposal-guidelines#RPP-co-fund-support-form
- **Schedule** - A detailed schedule is required.
- **References** (optional) – detailed citations are not required in the proposal, but may be provided at the discretion of the researcher.

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 Web Tool Criteria and Feasibility Study for The Water Research Foundation Project Deliverables at https://www.waterrf.org/project-report-guidelines#webtool-criteria.

Eligibility to Submit Proposals

Proposals will be accepted from domestic or international 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. The policy can be reviewed at https://www.waterrf.org/policies. 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.

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. The policy can be reviewed at https://www.waterrf.org/policies.

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 Monday, April 10, 2023.

The online proposal system allows submission of your documents until the date and time stated in this RFP. Submit your proposal in 1 PDF file at: https://forms.waterrf.org/230184354449862 .

Questions to clarify the intent of this RFP and WRF's administrative, cost, and financial requirements may be addressed to the WRF project contact, Dr. Jian Zhang at (303) 347-6114 or jzhang@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**.**

5208 Utility and Organization Participants

The following utilities have indicated an 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 upon your settings, you may need to click refresh on your browser to load the latest file.)**

N/A