



REQUEST FOR PROPOSALS (RFP)

Making the Case for Climate-Resilient Water Infrastructure and Supporting Strategies (5222)

Date Posted

Monday, September 11, 2023

Due Date

Proposals must be received by 3:00 pm Mountain Time on Tuesday, November 14, 2023

WRF Project Contact

Harry Zhang, PhD, PE, h Zhang@waterrf.org

Project Sponsors

This project is co-funded by The Water Research Foundation (WRF) and Water Utility Climate Alliance (WUCA) as part of WRF's Emerging Opportunities Program.

Project Objectives

- To develop water sector-specific guidance, including a decision-support tool on how to make a case for investments in climate-resilient stormwater, wastewater, and drinking water infrastructure, considering both structural approaches (i.e., physical assets) and non-structural approaches (e.g., codes and standards).
- To advance quantitative approaches to utility decision-making about climate resilient capital projects, as well as other approaches within the web of complex challenges facing water utilities today.
- To enhance stakeholder engagement and education by incorporating a collaborative component in the decision-support tool, enabling utilities to engage community members, utility staff, and peer agencies around climate-resilient water investments.

Budget

Applicants may request up to \$100,000 in WRF funds for this project. In-kind support is encouraged, though not required.

Background and Project Rationale

As climate impacts and disasters become more common and severe, and climate science becomes more mainstream, there is an urgent need for stormwater, wastewater, and drinking water utilities (hereafter referred to as 'water utilities') to explicitly consider and communicate the benefits and costs associated with climate-resilient infrastructure, programs, and policies. While many utilities use their own methods for evaluating climate resilience-related investments and approaches, there is no US-based, water sector specific guidance to compare

the costs against direct and indirect benefits over time. In particular, climate adaptation solutions, including infrastructure retrofits, new infrastructure, and non-structural approaches, such as codes and standards development. Water utilities would benefit from a comprehensive framework to define the benefits of adaptation investments, quantify costs and consequences, prioritize investments, consider adaptation alongside other drivers (e.g., regulatory obligations), and balance adaptation-related investments with ratepayer affordability.

Without better understanding and sector-specific guidance, water utilities may remain underprepared for future climate disasters. To address these challenges, we seek to develop a user-friendly decision-support tool to assist water sector leaders in evaluating budget decisions related to climate-resilient drinking water, wastewater, and stormwater investments. Given the obstacles facing water utilities today, the audience for this effort are water utility leaders, as well as utility staff and managers involved in relevant areas such as climate change adaptation planning, capital improvement planning, and budget planning.

The desired outcomes of this project are: (1) develop a comprehensive framework to maximize the effectiveness of water utilities' limited resources and ratepayer funds, ensure the long-term sustainability of water services, and promote climate-resilient, multi-beneficial solutions; (2) advance quantitative approaches to promoting climate-resilient infrastructure and approaches in concert with competing utility objectives; and (3) enhance utilities' ability to communicate with and engage stakeholders about climate adaptation investments and approaches.

Climate adaptation/resilience is one challenge within a complicated web of regulatory compliance, environmental stewardship, affordability, and asset management challenges facing water utilities today. Thus, the decision-support tool should integrate key climate factors, as well as consider other adjacent factors:

- Climate projections and their inherent uncertainty
- Asset management, identification of vulnerability hotspots, and sensitivity of assets to climate change impacts
- Risk mitigation priorities
- Climate resilience/level of service goals
- Adaptive management approaches and opportunities to distribute risk mitigation investments over time based on climate change outcomes
- Thorough consideration of costs and benefits, including operations and maintenance costs, direct and indirect benefits (e.g., social costs and benefits, such as reduced public health costs, reduced insurance premiums), and avoided future costs under different climate scenarios.

Research Approach

Through this project, the team will emphasize how water utilities can more effectively evaluate the benefits and costs of climate resilience investments and approaches. Respondents are welcome to further develop this approach in their proposals. Required steps are as follows:

1. **Set the stage:** Conduct a literature review and explore potential case studies in the water utility sector at a variety of scales (e.g., large, medium, and small utilities).
2. **Develop a decision-support tool for climate-resilient infrastructure investments and supporting strategies:** Using existing framework(s) as a starting point. Consider information gathered during the literature review process to develop a tool for water utilities to make the business case (social, environmental and financial) for climate-resilient infrastructure investments (i.e., physical assets and systems) and strategies (i.e., engineering design guidance, codes, and standards). Special consideration should be made to incorporate a stakeholder and community engagement component in the tool to enable collaboration, education, and transparency.
 - a. **Provide support for analysis with a climate resilience lens:** Identify the economic, social, and environmental costs and benefits associated with climate-resilient water infrastructure alternatives and strategies, considering mitigated risks, implementation costs, life cycle costs, future adaptability, energy requirements and greenhouse gas emissions, and potential co-benefits.
 - b. **Provide support for budget decision-making:** Provide decision-makers with clear and actionable information to support the allocation of financial resources for the most cost-effective and impactful climate-resilient water infrastructure projects and strategies.
3. **Show how the tool works:** Demonstrate use of the tool for at least two water utility systems (stormwater, wastewater, and/or drinking water).
4. **Summarize in a final report:** Consolidate all the above information into a simple and clear utility-facing final report that serves as a resource for the water utility sector.

Expected Deliverables

- A stand-alone literature review synthesis document, including annotations for the list of publications and resources used.
- Utility-facing research report that presents the decision-support tool in an easy-to-navigate format. In addition, the report should include utility case studies and a chapter summarizing knowledge gaps, research needs, and preliminary project concepts for recommended research projects in the future. (Must use WRF's Research Report Template, which can be found at <https://www.waterrf.org/project-report-guidelines#research-report-template>).
- Stand-alone case study summaries from at least two utilities following the tool's framework for making the case for climate-resilient investments.
- PowerPoint presentation to be given at two webcasts, including infographics that can help communicate research findings to water utilities.

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 15 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.

- City of Copenhagen. 2014. "Cloudburst Management Pays Off: Economics of cloudburst and stormwater management in Copenhagen." City of Copenhagen.
- Clements, J., J. Henderson, and A. Flemming. 2021. *Economic Framework and Tools for Quantifying and Monetizing the Triple Bottom Line Benefits of Green Stormwater Infrastructure*. Project 4852. Denver, CO: The Water Research Foundation.
<https://www.waterrf.org/research/projects/economic-framework-and-tools-quantifying-and-monetizing-triple-bottom-line>
- Cline, S. et. al. Forthcoming. *Enhancement of Resilience to Extreme Weather and Climate Events: Proactive Flood Management*. Project 4842. Denver, CO: The Water Research Foundation. <https://www.waterrf.org/research/projects/enhancement-resilience-extreme-weather-and-climate-events-proactive-flood>
- Fischbach, J. D. Knopman, A. Cohn, K.R. Grocholski, and J. Brock. 2020. *Climate-Resilient Planning for Urban Stormwater and Wastewater Utilities: Workshop Proceedings*. Project 5001. Denver, CO: The Water Research Foundation.
<https://www.waterrf.org/research/projects/climate-resilient-planning-urban-stormwater-and-wastewater-utilities-workshop>
- Hersh, E., M. Bartlett, and A. Verdin. Forthcoming. *Holistic and Innovative Approaches for Flood Mitigation Planning and Modeling under Extreme Wet Weather Events and Climate Impacts*. Project 5084. Denver, CO: The Water Research Foundation.
<https://www.waterrf.org/research/projects/holistic-and-innovative-approaches-flood-mitigation-planning-and-modeling-under>
- U.S. Environmental Protection Agency (USEPA) and Environmental Council of the States (ECOS). 2017. "Water Infrastructure Financial Leadership: Successful Financial Tools for Local Decision Makers." USEPA.
- U.S. Environmental Protection Agency (USEPA). 2022. Creating Resilient Water Utilities (CRWU) Risk Assessment Tools. <https://www.epa.gov/crwu>
- Water Utility Climate Alliance (WUCA). 2022. "Scaling and Application of Climate Projections to Stormwater and Wastewater Resilience Planning."
<https://www.wucaonline.org/assets/pdf/stormwater-wastewater-report-2022.pdf>
- The Water Research Foundation (WRF). 2022a. *Integrating Climate Change Impacts with Wet Weather Management, Capital Improvement, and Stream Network Enhancement*. RFP 5176. Denver, CO: WRF.
- The Water Research Foundation (WRF). 2022b. *Incorporating Equity and Social Dimension into Community Climate Adaptation Planning and Watershed Management*. RFP 5180. Denver, CO: WRF.

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 guidelines 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 fifteen 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 proposal 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 are encouraged but not required for submission. 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: The *Proposal Budget Form* can be found at <https://www.waterrf.org/proposal-guidelines>
 - Budget Narrative (see *Instructions for Budget Preparation*)

- *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 Tuesday, November 14, 2023.

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-5222> .

Questions to clarify the intent of this RFP and WRF's administrative requirements may be addressed to the WRF project contact, Harry Zhang, PhD, PE, at 571.384.2098 or h Zhang@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.)**

Marisela Aranguiz-Cueto

Deputy Director

Miami-Dade County

3071 SW 38th Avenue

Miami, FL 33131

(305) 799-6763

marisela.aranguiz-cueto@miamidade.gov

Keisha Thorpe

Chief Operations Officer

Clayton County Water Authority

1600 Battle Creek Road

Morrow, GA 30260

(770) 960-5217

keisha.thorpe@ccwa.us

Satish Tripathi, PE

Managing Engineer

City of Houston - Houston Water

611 Walker Street

18th Floor

Houston, TX 77002

(832) 395-3096

satish.tripathi@houstontx.gov