REQUEST FOR PROPOSALS (RFP)

Evaluating Scalability, Reproducibility, and Impact of GenAI and Agentic AI in the Water and Wastewater Sector (RFP 5394)

Date Posted
Wednesday, March 18, 2026.

Due Date
Proposals must be received by 3:00 pm Mountain Time on Wednesday, May 20, 2026.

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

Project Objectives
*   Identify ways for utilities to overcome key barriers to the adoption of Generative Artificial Intelligence (GenAI) and Agentic AI, including actionable guardrails such as integrating cybersecurity protocols into operations, implementing secure development practices into model training and deployment, and adopting and applying the National Institute of Standards and Technology AI risk management framework core functions, which help ensure secure AI deployment (NIST 2016).
*   Identify a minimum of four unique and meaningful GenAI pilot applications within the water/wastewater sector and implement each application at two additional utilities. Document the transfer process, data governance and data quality requirements, operational insights, lessons learned on reproducibility, and early impacts of each demonstration. One application should focus on knowledge transfer and training.
*   Catalogue Agentic AI applications currently in use within the water/wastewater sector and capture key lessons learned and early impacts from each application.
*   Reproduce one low-effort Agentic AI application at another utility and document the transfer process and lessons learned.

Budget
Applicants may request up to $200,000 in WRF funds for this project.

Background and Project Rationale

The water and wastewater utilities and owners' systems are undergoing significant digital transformation. Emerging digital technologies offer opportunities to streamline operations, alleviate workforce challenges, optimize treatment processes, and enhance overall efficiency. Among these technologies, AI, particularly GenAI and Agentic AI, emerges as a powerful enabler for increasing efficiency across everyday utility needs.

GenAI refers to AI systems capable of creating new content (such as text, images, code, video, and music) based on patterns learned from existing knowledge and training data sets. A common example of GenAI is a chatbot like ChatGPT or Google Gemini. These AI assistants can also be created by utilities and trained to generate utility-specific responses. For example, a utility-specific chatbot can be created to extract insights from complex regulatory and technical documents and turn static text into dynamic, searchable knowledge that delivers concise answers, summaries, and audio briefings. This allows the organization to ask questions like, "How will the proposed regulation impact our operations?" to inform its utility planning. GenAI may also be used to help with customer service, health and safety protocols, HR operations, and operational efficiency. Agentic AI, on the other hand, refers to AI systems that can autonomously plan and carry out multi-step tasks with minimal human input. For example, it can process geospatial data in real-time and dispatch maintenance crews to potential flood zones, enabling proactive decision-making.

This study proposes an approach that evaluates both GenAI and Agentic AI at the same time to help utilities identify the similarities and differences between the challenges, guardrails, precautions, and benefits of the technologies. Learning to scale and replicate both tools will give utilities greater freedom and flexibility to find solutions that are right for their organizations.

While the benefits of GenAI and Agentic AI are compelling, many uncertainties remain. As utilities progress in their digital transformation journeys, they also encounter new risks. The sector has made progress in identifying barriers to AI adoption, but there is still much to learn about overcoming them. For example, *The Role of Generative AI (GenAI) for the Global Water Sector* (Hale et al. Forthcoming) outlines cybersecurity risks and workforce obstacles as key challenges associated with GenAI implementation. However, additional actionable and concrete guidance is needed to help utilities overcome these obstacles to safeguard their systems. Additionally, and most critically, there is limited information on the scalability, reproducibility, and impact of specific AI applications. Hale et al. (Forthcoming), *Artificial Intelligence Adoption Framework for Water and Wastewater Utilities* (Chandrasekeran et al. Forthcoming), and *Development of Agentic AI Framework for DC Water and HRSD* (Lesnik et al. Forthcoming)*,* among other WRF projects, provide a valuable foundation for AI research and outline clear examples of GenAI and Agentic AI applications. However, the projects do not necessarily test the scalability, reproducibility, or impact of specific applications. Research is needed to determine if and how pilots and demonstrations from one utility can be adopted and implemented in another. This will be especially valuable for small and medium sized utilities that are not currently piloting GenAI and Agentic AI. This has the potential to save significant

time, effort, and money. It will also give utilities the ability to evaluate if the use of GenAI or Agentic AI is right for their organization.

AI is evolving at an unprecedented rate, outpacing other technological advancements within the water and wastewater sectors. Timely research is essential for WRF subscribers to harness the full potential of AI. It should be noted that GenAI research is further along than Agentic AI research, and this difference is recognized in the research approach. For GenAI, there are documented examples of GenAI pilots and applications. To move to the next stage of implementation, research is needed that focuses on the reproducibility of specific GenAI applications and the impact of use cases. For Agentic AI, utilities are just beginning to pilot specific use cases. As a result, the most pressing research gap for Agentic AI is clearly identifying use cases, establishing structural needs (e.g., human in the loop designs), documenting their early impact, and discussing key considerations for reproducing the application. A full reproducibility study for Agentic AI is not feasible at this time.

This research will serve as a fundamental building block to increased AI adoption, helping utilities navigate implementation challenges and learn from pilot programs already underway. By doing so, subscribers will be better positioned to embrace the digital age.

Research Approach
The research team will identify the technical, organizational, security, and regulatory challenges associated with adopting GenAI and Agentic AI in water and wastewater utilities and develop recommendations and guardrails available to overcome them. The first component of the study will be a targeted literature review to surface common hurdles and emerging concerns in AI deployment and promising opportunities to overcome these challenges. This review should investigate existing cybersecurity protocols tailored to AI systems, AI architectural design options, data governance models, and fail-safe requirements to ensure operational continuity. The benefits and tradeoffs of the different protocols/models/options should be documented. The team should build off relevant WRF research where applicable, however, given the novel nature of the technologies, information from adjacent sectors and reputable research organizations should also be included. Teams may also engage with utility stakeholders to validate findings and identify context-specific challenges.

Based on their findings, the team will outline actionable guardrails and recommendations that utilities can implement for responsible AI deployment. The guidance should include recommendations for how to build momentum and agility in a space that is rapidly evolving. A utility's size and digital maturity should be considered when developing guardrails and recommendations. The key findings should be presented in an interim white paper that WRF can publish part way through the project to begin disseminating project results. The full literature review and recommendations/guardrails will be incorporated into the final research report. The findings should also be incorporated into the GenAI pilots and Agentic AI evaluations.

The team will identify four high-potential GenAI applications with wide applicability that have been successfully implemented at a water or wastewater utility and pilot them at a minimum of two additional utilities, with the research team supporting the transfer process. There should be at a minimum, eight replication case studies.

Documentation of the technology transfer process and implementation journey, at a minimum, must include:

- Technical integration requirements
- Data architecture and data cleanliness requirements
- Cybersecurity safeguards
- Expertise needed to operate technology
- Scalability considerations
- Operational insights and lessons learned, including implementation challenges
- Early impacts of each demonstration (such as staff time saved, workflow improvements, cost reductions, etc.)

One application must focus on knowledge transfer and staff training. Other applications to consider, but are not limited to, are customer service support, human resources/employee management, and reporting. Additional applications may be piloted based on team capacity and utility interest. The research team should consider having one of these assessments focus on an underlying foundational platform (e.g., an Industrial DataOps platform, which could be transferable to municipal applications) that enables the utility to build, deploy, and scale multiple AI use cases.

GenAI pilots must be conducted with utilities of different sizes to explore the scalability of the application. When selecting utilities to replicate and scale GenAI applications, the team should describe the criteria/method for utility selection. Applications must utilize enterprise technologies and be considered human in the loop applications.

The team must also catalogue Agentic AI applications currently in use within the water and wastewater sector and capture key lessons learned and early impacts from each application. This will require teams to conduct a literature review (including reviewing existing WRF projects like Lesnik et al. Forthcoming.) and utility interviews and/or surveys.

One low-effort Agentic AI application identified should be demonstrated at another water or wastewater utility. The team should document the technology transfer process and lessons learned. The implementation journey should cover the same topics as the GenAI demonstrations. At a minimum, a basic template for piloting similar concepts and implementation (if possible) at other utilities shall be developed based on the findings.

The study will conclude with key takeaways and recommendations on GenAI and Agentic AI application transfers that will inform broader sector adoption.

Expected Deliverables
- Interim WRF white paper
- Literature review summary (to be later included in the project report)
- Research report (must use WRF's *Research Report Template*)
- Webcast, conference presentation, etc.
- Case studies

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 15 months from the contract start date.

References and Resources
The following list of WRF projects are expected to be published mid-to late-2026.

- Chandrasekeran, P. et al. Forthcoming. *Artificial Intelligence Adoption Framework for Water and Wastewater Utilities.* Project 5189. Denver, CO: The Water Research Foundation. https://www.waterrf.org/research/projects/artificial-intelligence-adoption-framework-water-and-wastewater-utilities.
- Chandrasekeran, P. et al. Forthcoming. *Preparing the Water Sector to Embrace Technology: Skillsets and Enterprise Management Approaches for the Digital Age*. Project 5178. Denver, CO: The Water Research Foundation. https://www.waterrf.org/research/projects/preparing-water-sector-embrace-technology-skillsets-and-enterprise-management.
- Hale, D. et al. Forthcoming. *The Role of Generative AI (GenAI) for the Global Water* Sector. Project 5321. Denver, CO: The Water Research Foundation. https://www.waterrf.org/research/projects/role-generative-ai-genai-global-water-sector.
- Lesnik, K. et al. Forthcoming. *Development of Agentic AI Framework for DC Water and HRSD.* Project 5349. Denver, CO: The Water Research Foundation. https://www.waterrf.org/research/projects/development-agentic-ai-framework-dc-water-and-hrsd-0.
- National Institute of Standards and Technology (NIST). 2016. *About the Risk Management Framework (RMF).* National Institute of Standards and Technology. https://csrc.nist.gov/projects/risk-management/about-rmf.

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 20 points)
- Communication Plan, Deliverables, and Applicability (maximum 15 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 Emerging Opportunities Research Program Proposals*. The guidelines contain instructions for the technical aspects, 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, spreadsheets, 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, consultants, or other for-profit entities.

WRF's Board of Directors has established a *Timeliness Policy* that addresses researchers 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.

Budget and Funding Information
The maximum funding available from WRF for this project is $200,000. Consult the *Instructions for Budget Preparation* on the *Outbound Grants page* 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 of utilities and other organizations that have indicated an interest in this research. Proposers are responsible for negotiating utility and organization participation in their proposals. The listed utilities and organizations are under no obligation to participate, and the proposer is not obligated to include them in their proposal.

Application Procedure and Deadline

Proposals are accepted exclusively through WRF's portal and they must be fully submitted before 3:00 pm Mountain Time on Wednesday, May 20, 2026.

To learn how to submit a proposal for this RFP, please visit www.waterrf.org/proposals and follow the instructions on the page.

Questions to clarify the intent of this RFP and WRF's administrative, cost, and financial requirements may be addressed to the WRF project contact, Sydney Samples at 571.384.2108 or ssamples@waterrf.org. Questions about how to submit proposals through WRF's Portal should be directed to WRF's Customer Care Form.